

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 2,0 g 4

4. Edition

En

PES 4 M 50 C 320 RS 103
RSF 375 / 2250 M 19
Komb.Nr. 0 400 074 978
Sales model 400 074 977

superceded 10.81
company Daimler-Benz
engine 0m 615
44 kW (60 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,70-1,80 mm (from BDC) Control rod travel 20mm
(1,65-1,85)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning compensating valves mm
1	2	3	4	2	3	6
1000	12,7 ^{+0,1}	3,2-3,3	0,25(0,3)			
375	6,9-7,1	0,65-0,75	0,1(0,15)			
1800			0,25(0,3)			
2200			0,25(0,3)			

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min	Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min		Rotational speed rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
13-17	① min. 12,5	250		⑦ 11,8-12,0	2200		⑫ 100	min. 20,3
	② 6,9-7,1	375	50	⑧ 7,2-7,6	2500		⑬ 1800	12,2-12,4
	③ **	400		⑨ -	-		⑭ 1000	12,7-12,8
	④ -	-		⑩ 0 - 1,0	2950			
	⑤ 2,5	720-820		⑪			⑥ Switching point	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery (19)		Full-load speed regulation (20)	Variations in fuel delivery (17)		Starting fuel delivery idle (18)		Difference
Test oil temp 40°C (104°F)							
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes
1	2	3	4	5	6	7	8
2200	33,0-35,0 (32,0-36,0)	2500* RW 7,2-7,6	1800	33,0-35,0 (32,0-36,0)	100	min. 55,0	6,0 (22)
			1000	32,0-33,0 (32,0-35,0)	375	6,5-7,5 (5,5-9,0)	1,0
					2500	13,0-17,0 (12,0-18,0)	1,5
							2,5 see (15)
							3,0 (16)

Checking values in brackets

* 1 mm less control rod travel than in Column 2
ca. 3,5 xxxxxxxx

12.82

BOSCH

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1. ** Set the idle auxiliary spring at $n = 400 \text{ min}^{-1}$ so that the control-rod travel is exceeded by 0.1 - 0.2 mm.

2. Setting the idle control-lever position:

At 1000 min^{-1} , control rod travel 1.9 - 2.0 mm

3. Check the idle auxiliary spring shutoff

Control-lever position 47° . After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30° . Speed range $350 \text{ min}^{-1} - 450 \text{ min}^{-1}$

4. Check the pneumatic shutoff box

Control lever at idle stop.

At $n = 375 \text{ min}^{-1}$ and $p_u = 450 \text{ mbar (vacuum)}$ (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 10,0 o

2. Edition

En

Testoll-ISO 4113

PE 6 P 110 A 320 RS 3080

RQV 250-1100 PA 589

supersedes 81
company Volvo
engine TD 100 GA

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,5-3,6
(3,45-3,65) mm (from BDC): RW 9,0 - 12,0 mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
700	12,2±0,1	16,7 - 16,9	0,4(0,8)			
250	4,0-4,2	1,6 - 2,0	0,3(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1180	15,2-17,8	-	-	-	ca. 8	100	min. 5,6	200	0,6-0,9
ca. 63	11,2	1160-1170					250	4,0-4,2	600	5,4-6,4
	4,0	1225-1255							670	6,4-6,6
	1350	0 - 1,0					305-365=2,0mm		1040	7,3
						③			1100	

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed	Fuel delivery characteristics		Starting fuel delivery		Torque-control
rev/min	cm ³ /1000 strokes	②b	high idle speed	⑤b	idle switching point	⑥	travel
1	2	3	4	5	6	7	8
LDA	0,75 bar	1160-1170 *	LDA	0 bar	100	160,0-190,0	
700	167,0-169,0 (164,0-172,0)		700	121,0-125,0 (118,0-128,0)		/ 20,0-21,0 mm RW	

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
~~XXXXXX~~

Pump/governor	Setting	Measurement	Control rod travel mm (1)
.. LS 3080 + .. PA 589	0,54	0,75 0 0,34	11,8 - 11,9 12,2 - 12,3 9,7 - 9,9 10,5 - 10,7

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 15,8 e

2. Edition

En

Testoil-ISO 4113

PE 10 P 110 A 920/5 LS 3073

RQV 300-1250 PA 549

RQV 300-1250 PA 549-1

superse 82

comp. KHD

engine: BF 10 L 413 F
294 kW (400 PS)₁
/ 2500 min

1 - 10- 9 - 4 - 3 - 6 - 5 - 8 - 7 - 2

0 - 27-72 -99 -144-171-216-243-288-315° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,8 - 2,9}{(2,75-2,95)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	12,1+0,1	14,8 - 15,2	0,4(0,8)			
300	6,3-6,5	1,1 - 1,5	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

... PA 549 + .. PA 549-1

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1340	15,2-17,8	-	-	-	ca. 13	100	min. 8,0	250	0,5-0,8
ca. 66	11,1 4,0 1500	1290-1300 1370-1400 0 - 1,0					300	6,3-6,5	580	2,9-3,1
							320-500=2,0mm		920	4,8-5,0
									250	8,0

Torque control travel s = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed ②b intermediate speed 4a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤ Control rod travel mm	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
LDA 1250	0,9 bar 148,0-152,0 (146,0-154,0)	1290-1300*	LDA 900	0,9 bar 143,0-147,0 (140,0-150,0)	100	130,0-150,0 / 13,0 - 13,2 mm RW	-	-
			LDA 500	0 bar 95,0-97,0 (92,0-100,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE10P..LS3073 + ..PA 549 + ..PA 549-1	0,9	0 0,55 0,47	12,1 - 12,2 9,7 - 9,8 11,1 - 11,2 9,9 - 10,1

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 e

2. Edition

En

Testoil-ISO 4113

PE 12 P 110 A 920 LS 3060 RQV 300-1250 PA 479 KR

supersede 9.82

company: KHD

engine: BF 12 L 413 FC

386 kW - 2500 min⁻¹

1 - 4 - 9 - 8 - 5 - 2 - 11- 10- 3 - 6 - 7 - 12
0 - 45- 60-105-120-165-180-225-240-285-300-345°_{+0,5°} (_{+0,75°})

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	11,7+0,1	14,7 - 15,1	0,4 (0,8)			
300	6,7-6,9	1,6 - 2,2	0,7 (1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1270	15,2-17,8	-	-	-	ca. 13	100	min. 8,3	250	0,2-0,6
ca. 60	10,7 4,0 1550	1280-1290 1385-1415 0 - 1,0					300 350-500	6,7-6,9	580 920 1250	3,4-3,7 5,3-5,5 8,3

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1250	0,75 bar 147,0-151,0 (145,0-153,0)	1280-1290*	LDA 850	0,75 bar 122,0-126,0 (119,0-129,0)	100	140,0-160,0	1250	11,7+0,1
			LDA 500	0 bar 78,0-80,0 (74,0-84,0)			850	11,0+0,1
							500	10,1+0,2

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

A7

A7

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 12 P..LS 3060 + ..PA 479 KR	0,35	0,75 0 0,22	10,1 - 10,3 10,4 - 10,5 9,0 - 9,2 9,6 - 9,8

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 KHD

2. Edition

En

Testoil-ISO 4113

PE 10 P 110 A 920/5 LS 3073 RQV 300-1150 PA 549

1-10-9 - 4- 3 - 6 - 5 - 8 - 7 - 2

0-27-72-99-144-171-216-243-288-315 ° $\pm 0,5$ ° ($\pm 0,75$ °)

superseded 9.82

company: KHD

engine:

BF 10L 413 F

265 kW (360 PS)

bei 2050 min⁻¹

bzw. 259 kW (352 PS)

(Maxidyne)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8-2,9
(2,75-2,95)

mm: (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
800	11,6 \pm 0,1	13,8-14,0	0,4(0,8)			
300	6,9-7,1	1,8 - 2,4	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1220	15,2-17,8	-	-	-	ca.12	100	min.8,5	250	
							300	6,9-7,1	550	
							465-525 = 2,0		1150	
ca. 64	9,7 4,0 1400	1190-1200 1270-1300 0 - 1,0				③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 800	0,9 bar 138,0-140,0 (135,0-143,0)	1190-1200 *			100	110,0-140,0	1150	10,7 \pm 0,2
							1025	10,9 \pm 0,2
							875	11,4 \pm 0,2
							800	11,6 \pm 0,1
			LDA 500	0 bar 85,0-89,0 (82,0-92,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min ^{decreasing} pressure - in bar gauge pressure
^{increasing}

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 10 P..LS 3073 RQV.. PA 549	0,55	0,90 0 0,39	11,2-11,3 11,6-11,7 9,4-9,5 10,1-10,3

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 RVI 8,8 d

3. Edition

En

Testoil-ISO 4113

PES 6 P 120 A 320 RS 419 Z RQV 250-1100 PA 540

supersedes 40.81

company: RVI

engine: MIDR 06.20.30
188 kW(256PS)

1 - 5 - 3 - 6 - 2 - 4 je 60°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(2,75-2,95)
2,80-2,90

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valves) mm 6
1100	9,5-9,6	20,2 - 20,6	0,5(0,9)			
250	4,4-4,6	1,4 - 2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1270	15,2-17,8				ca. 10	100 250	min. 6,0 4,4-4,6	200 500 800 1100	0,8-1,0 3,5-3,6 4,8-4,9 6,9
ca. 61	8,5 4,0 1350	1140-1150 1215-1245 0 - 1,0				280-400 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)		Rotational speed (2b) limitation intermediate speed (4a) rev/min (3)		Fuel delivery characteristics (5a) high idle speed (5b) rev/min (4) cm³/1000 strokes (5)		Starting fuel delivery (6) idle switching point rev/min (6) cm³/1000 strokes (7)		Torque-control (5) travel rev/min (8) Control rod travel mm (9)	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9	
LDA 1100	0,7 bar 202,0-206,0 (199,0-209,0)	1140-1150*	LDA 1100	0 bar 142,0-146,0 (139,0-149,0)					

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

A11

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PES 6 P..RS 419Z + RQV..PA 540	0,26	0,70 0 0,21	9,0 - 9,1 9,5 - 9,6 7,4 - 7,5 7,9 - 8,1

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps **(1A)** and Governors

40

WPP 001/4 KHD 1g9

1. Edition:

En

PES 6 MW 100/720 RS 1013
RSV 325...1100 MW 8/310
komb. Nr.: 0 403 476 010

supersedes **5.81**
company: KHD
engine: BF 6 L 413 FR
Tractor DX 230
147 kW bei 2200 min⁻¹

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,10 - 3,20$ mm (from BDC) $RW = 9,0 - 12,0$ mm
 $(3,05 - 3,25)$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,8 ^{+0,1}	10,6 - 10,8	0,35(0,6)			
325	5,6-5,8	1,25- 1,65	0,35(0,55)			
900	12,4+0,1		0,5 (0,7)			
500	10,6+0,1		0,35(0,6)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

(1) Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed 4 5 6			(4) Lower rated speed Control-lever deflection in degrees 7			(3) Torque control Control rod travel mm 10 11	
Control rod travel mm 2	Control rod travel mm rev/min 3					rev/min 8	Control rod travel mm 9		rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0				ca. 18	325	5,2	1100	11,8-11,9
							100	min. 19	900	12,4-12,5
							325	5,6-5,8		
							550-610	2,0		
ca. 50	1140-1150 = 10,8									
(2a)	1155-1185 = 4,0									
	1360 = 0,3-1,7									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop Test oil temp 40°C (104°F) rev/min 1		(6) Rotational-speed limit Note: changed to) rev/min 3		(3a) Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		(4a) Idle stop Control rod travel mm 9	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7		rev/min 8	
LDA 1100	0,55 bar 106,0-108,0 (104,0-110,0)	1140-1150*		LDA 900 0,55 bar 114,5-118,5 (112,5-120,5)		100	min. 120	325	5,7
				LDA 500 0 bar 82,5-84,5 (80,5-86,5)		325	12,5-16,5 (10,0-19,0)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

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11.82

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
RS 1013 + MW 8/310		0,4	11,9 - 12,0
		0,55	11,1 - 11,2

Notes.

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 DEE 7,6 a

1. Edition

En

PES 6 P 110 A 720 RS 361

RSV 400-1050 P2/478

sûpercedes John Deere

company: 6466 AR-06

engine: 167 kW (227 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,70-2,90)

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1050	11,5 +0,1	15,0-15,2	0,4 (0,8)			
400	6,2-6,3	1,2-1,8	0,4 (0,8)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 20	400	5,7	1050	11,5-11,6
	X =						100	min. 19,0	650	12,3-12,4
ca. 44	10,5	1105-1115					400	6,1-6,3	500	8,4-8,5
2a	4,0	1185-1215					570-630	= 2,0		
	1280	0,3 -1,7					800	max. 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a idle stop	
Test oil temp 40°C (104°F)		Note: changed to ...				Idle			
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
LDA 1050	0,65 bar 150,0-152,0 (147,0-155,0)	1105-1115*		LDA 650	0,66 bar 162,0-166,0 (159,0-169,0)	100	155,0-175,0	400	6,2
				LDA 500	0 bar 74,0-80,0 (71,0- 83,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

BOSCH

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A15

A15

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PES 6 P..RS 361 +RSV..P2/478	0,67	0,36	11,5-11,6 9,8- 9,9

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 KHD 15,8 g

2. Edition

En

PE10P110A920/5 LS 3073 RQ300/1150PA535

superseded 0.82

company: BF10L413F

engine: 265kW (360 PS)₁
/ 2050 minbzw. 259 kW (352 PS)
/ 2300 min⁻¹
(Maxidyne)

1-10- 9- 4- 3 - 6 - 5 - 8 - 7 - 2

0-27-72-99-144-171-216-243-288-315° ±0,5° (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	11,6+0,1	13,8-14,0	0,4(0,8)			
300	6,9-7,1	1,8-2,4	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 4		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 9		Torque control rev/min 11		Control rod travel mm 12	
700	19,2-20,9	700	20,0	9,7 4,0	1195-1205 1220-1250	300	7,0	100 300	min.8,5 6,9-7,1	1150 800 1020 1050	10,7-10,9 11,6-11,7 11,5-11,7 11,2-11,4		
VH= max. 46°				1350	0-1,0			340-380= 2,0					

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod tr / el

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
LDA 800	0,9 bar 138,0-140,0 (135,0-143,0)		-	LDA 500	0 bar 85,0-89,0 (82,0-92,0)	100	115,0-140,0

Checking values in brackets

1.85

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE10P..LS3073 + .. PA535	0,55		11,2-11,3
		0,90	11,6-11,7
		0	9,4-9,5
		0,39	10,1-10,3

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications

Fuel Injection Pumps ②

and Governors

WPP 001/4 DAF 11,6 n 3

1. Edition

En

PE 6 P 110 A 320 RS 407-1 RQ 250/1100 PA 428/2 R

supersedes -

company: DAF

engine: DKTL 1160

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 - 2,9$ mm (from BDC) = RW 9,0 - 12,0 mm
 $(2,75-2,95)$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	12,3+0,1	13,9-14,1	0,4 (0,8)			
250	7,1-7,3	1,1-1,5	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2		Test specifications Control rod travel mm 4		Test specifications rev/min 6		Test specifications Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 12	
600	15,6-16,4	600	16,0	11,3 4,0 1350	1145-1160 1200-1230 0 - 1,0	250	7,2	100 250 345-385 = 2,0	min. 7,3 7,1-7,3	850 1100	12,3+0,1 12,2+0,2

Torque-control travel

on flyweight assembly dimension a = mm

Speed regulation: At

1145-1160 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes/mm 7	
LDA 850	0,5 bar 139,0-141,0 (136,0-144,0)	-		LDA 600	0 bar 135,0-138,0 (132,0-141,0)	100	245,0-285,0 = 19,5-21,0 mm RW

Checking values in brackets

12.82

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 600 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE6P..RS407-1 + RQ..PA 428/2R	0,30	0,50 0	12,1 - 12,2 12,3 - 12,4 12,0 - 12,1

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 SCA 11,0 r 5

2. Edition

En

Testoil-ISO 4113

PE 6 P 110 A 720 RS 3040

RQV 250-1000 PA 555

 superseded by 81
 company Scania
 engine DS 11

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,3 - 3,4$ mm (from BDC) RW 9,0 - 12,0 mm
 (3,25-3,45)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	13,6+0,1	17,1 - 17,3	0,4(0,8)			
225	4,2-4,4	0,9 - 1,3	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel ①	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1050 1300	15,2-17,8 0 - 1,0	-	-	-	ca. 9	100 225	min.5,7 4,2-4,4	200 470 730 1000	1,0-1,2 3,5-3,9 5,2-5,4 8,0
ca. 60	12,6 4,0	1040-1050 1140-1170				250-355				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed ②b limitation intermediate speed rev/min ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min cm ³ /1000 strokes		Starting fuel delivery idle switching point ⑥ rev/min cm ³ /1000 strokes		Torque-control ⑤ travel rev/min Control rod travel mm	
1	2	3	4	5	6	7	8	9
LDA 1000	0,7 bar 171,0-173,0 (168,0-176,0)	1040-1050 *	LDA 600 168,0-171,0 (165,0-174,0) LDA 500 127,0-131,0 (124,0-134,0)	0,7 bar 168,0-171,0 (165,0-174,0) 0 bar 127,0-131,0 (124,0-134,0)	100	220,0-270,0 20,0- 21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing
XXXXXXX

SCA 11,0 r 5

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod ^{diminution} ^{difference} mm (1)
.. RS 3040 + .. PA 555	0,7	0,41 0,26 0	13,6 - 13,7 13,1 - 13,3 12,3 - 12,4 11,9 - 12,0

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 12,0 f 4

1. Edition

En

PE6P120A320RS3071Z.

RQV 250-1025 PA 371

supersedes..

company: Volvo

engine: TD 120 G/USA

243 kW (330 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke ^{2,6-2,7}
 (2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,4+0,1	20,6-20,9	0,5(0,9)			
250	5,3-5,5	2,2 - 2,6	0,3(0,6)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1100	15,2-17,8	-	-	-	ca. 12	100	min.7,0	200	0,7-0,9
ca. 42	10,4	1065-1075					250	5,3-5,5	475	2,8-3,1
	4,0	1145-1175					310-360=2,0		750	4,8-5,1
	1300	0 -1,0							1025	7,2

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 700	0,9 bar 206,0-209,0 (203,0-212,0)	1065-1075*	LDA 700	0 bar 176,0-180,0 (173,0-183,0)	100	240,0-280,0 =RW 20,0 21,0 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

-2-
VOL 12,0 f 4

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE6P..RS3071Z + RQV.. PA 371	0,45	0,90 0 0,28	11,0-11,1 11,4-11,5 9,7- 9,8 10,1-10,3

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,6 b 1

1. Edition

En

PES 6 MW 100/320 RS 1107
RQV 350-1200 MW 43

0 40 3 446 135

Nozzle-and-holder assembly
1 683 901 016 (207 + 3 bar)

supersedes -

company IHC - USA

engine DTC 466 B

121,3 kW (165 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{4,00-4,10}{(3,95-4,15)}$ mm (from BDC) $RW = 9,0 - 12,0$ mm						
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	11,1+0,1	8,4 - 8,6	0,35(0,6)			
350	5,9-6,1	1,6 - 2,0	0,35(0,55)			
1200	11,1+0,1		0,65(0,7)			
500	9,8+0,1					

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever mm 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever mm 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever mm 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	8,0 0 - 1	1355-1395 1450	-	-	-	ca. 14	100 350	min.9,0 5,9-6,1		
ca.60,5	4,0	1365-1375				370-650				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a		Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel Control rod travel mm ⑤	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9	
LDA 800	0,9 bar 84,0-86,0 (82,0-88,0)		LDA 1200	0,9 bar 86,5-90,5 (84,5-92,5)	100	19,0-21,0 mm RW 140-180			
			LDA 500	0 bar 61,5-63,5 (59,5-65,5)	220-280(210-290)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

B1

8/1

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D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at $n =$ 500 rev/min decreasing pressure - in bar gauge pressure increasing
IHC 7,6 b 1

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
RS 1107 RQV .. MW 43	0,3	0,9 0 0,13	10,8 - 10,9 11,1 - 11,2 9,8 - 9,9 10,1 - 10,2

Notes

(1) when $n =$

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than $n = 500 \text{ min}^{-1}$.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,5 a 1

1. Edition

En

PES 6 MW 100/320 RS 1103

RQV 350-1300 MW 43

0 403 446 131

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

supersedes

company IHC

engine DT 466 B

154,5 kW (210 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,00-4,10 mm (from BDC) RW = 9,0 - 12,0 mm
(3,95-4,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	11,9+0,1	10,3 - 10,5	0,35(0,6)			
350	6,0-6,2	1,6 - 2,0	0,35(0,55)			
1300	11,9+0,1		0,65(0,7)			
500	9,6+0,1					

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	8,0 0 - 1	1440-1505 1600	-	-	-	ca. 14	100 350	min.9,0 6,0-6,2		
ca. 62,5	4,0	1475-1485				370-650 3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 900	0,9 bar 103,0-105,0 (101,0-107,0)		LDA 1300	0,9 bar 107,0-111,0 (105,0-113,0)	100	19 - 21 mm RW 140 - 180		
			LDA 500	0 bar 63,5-65,5 (61,5-67,5)	220-280(210-290)			

Checking values in brackets

* 1 mm less control rod travel than col 2

12.82

Testoil-ISO 4113

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D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

IHC 7,6 a 1

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
RS 1103 + RQV .. MW 43	0,51	0,9 0 0,28	11,3 - 11,4 11,9 - 12,0 9,6 - 9,7 10,4 - 10,5

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than $n = 500 \text{ min}^{-1}$.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,6 C

1. Edition

En

PES 6 MW 100/320 RS 1103
RQV 350-1300 MW 43-1
0 403 446 132

supersedes _

company: IHC-USA

engine: DT 466 B

143,4 kW (195 PS)

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,00-4,10
(3,95-4,15) mm (from BDC) RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	12,9+0,1	9,55-9,75	0,35(0,6)			
350	5,7-5,8	1,6 - 2,0	0,35(0,55)			
1300	10,9+0,1		0,65(0,7)			
500	9,4-9,4					

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	8,0 0-1	1355-1395 1500	-	-	-	ca. 13	100 350	min. 9,0 5,8 - 6,0		
ca. 61,5	4,0	1457-1467			360-700	3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 900	0,9 bar 95,5-97,5 (93,5-99,5)		LDA 1300	0,9 bar 96,5-100,5 (94,5-102,5)	100	19-21 mm RW 140-180		
			LDA 500	0 bar 63,5-65,5 (61,5-67,5)	220-280 (210-290)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

IHC 7,6 c

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
RS 1103 + RQV..MW 43-1	0,4	0,9 0 0,19	10,5 - 10,6 10,9 - 11,0 9,4 - 9,5 9,8 - 9,9

Notes.

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than $n = 500 \text{ min}^{-1}$.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,6 e

En 1 Edition

PES 6 MW 100/320 RS 1108

RQV 350-1200 MW 43-3

0 403 446 137

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

supersedes

company IHC-USA

engine DT 466 B

132,4 kW (180 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke		mm (from BDC)		RW=9,0-12,0 mm		Spring pre-tensioning (torque-control valve)
Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm
1	2	3	4	2	3	6
800	11,5+0,1	9,05-9,25	0,35(0,6)			
350	6,2-6,3	1,6-2,0	0,35(0,55)			
1200	11,5+0,1		0,65(0,7)			
500	10,0+0,1					

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	8,0	1360-1400	-	-	-	ca. 17	100	min. 9,0		
	0,1	1450					350	6,2-6,3		
ca. 60,5	4,0	1380-1390				370-650				
						③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery		Rotational speed		Fuel delivery characteristics		Starting fuel delivery		Torque-control	
Control-rod stop	Test oil temp. 40°C (104°F)	limitation	intermediate speed	high idle speed		idle	switching point	travel	Control rod travel
rev/min		rev/min		rev/min		rev/min		rev/min	
1	2	3	4	5	6	7	8	9	
LDA	0,9 bar		LDA	0,9 bar					
800	90,5-92,5		1200	93,0-97,0		100	19-21		
	(88,5-94,5			(91,0-99,0)			mm RW		
			LDA	0 bar			140,0-180,0		
			500	60,0-62,0					
				(58,0-64,0)			220-280(210-290)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

BOSCH

Geschäftsbereich KM, Kundendienst, Kfz-Ausrüstung.
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12.82

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at $n =$ 500 rev/min decreasing pressure - in bar gauge pressure
increasing

IHC 7,6 e

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
RS 1108 + RQV.. MW 43-3	0,42	0,9 0 0,19	11,1 - 11,2 11,5 - 11,6 10,0 - 10,1 10,3 - 10,4

Notes

(1) when $n =$ rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than $n = 500 \text{ min}^{-1}$.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7.6. f

1. Edition

En

PES 6 MW 100/320 RS 1108
RQV 350-1300 MW 43-4
0 403 446 138

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

supersedes
company: IHC
engine: DT 466 B
154,5 kW (210 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,00-3,10
(2,95-3,15)

mm (from BDC) RW = 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	12,6-0,1	10,7-10,9	0,35(0,6)			
350	6,5-6,6	1,6-2,0	0,35(0,55)			
1300	12,6+0,1		0,65(0,7)			
500	9,6+0,1					

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	8,0	1440-1505	-	-	-	ca. 16	100	min.9,0		
	0-1	1580					350	6,1-6,2		
ca.61,5	4,0	1500-1510				370-650				

Torque control travel s = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 900	0,9 bar 107,0-109,0 (105,0-111,0)		LDA 1300	0,9 bar 112,5-116,5 (110,5-118,5)	100	19-21 mm RW		
			LDA 500	0 bar 53,5-55,5 (51,5-57,5)	220-280(210-290)	140-180		

Checking values in brackets

* 1 mm less control rod travel than col. 2
12.82

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

-2-

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
RS 1108 + RQV .. MW 43-4	0,57	0,9 0 0,27	11,9 -12,0 12,6 -12,7 9, 6-9,7 10,4 -10,5

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than $n = 500 \text{ min}^{-1}$.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 IHC 7,6a

1. Edition

En

PES 6 MW 100/320 RS 1107
RQV 350-1200 MW 43-2
0 403 446 136

supersedes -

company: IHC-USA

engine: DT 466 B

132,4 kW (180 PS)

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\begin{matrix} 4,00-4,10 \\ (3,95-4,15) \end{matrix}$ mm (from BDC) $\begin{matrix} 9,0 \\ 12,0 \end{matrix}$ mm						
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	11,8+0,1	9,45-9,65	0,35 (0,6)			
350	5,9-6,1	1,6 - 2,0	0,35 (0,55)			
1200	11,8-11,9		0,65 (0,7)			
500	10,4-10,5					

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	8,0 0-1	1355-1395 1500	-	-	-	ca. 15	100 350	min. 9,0 5,9-6,1		
ca. 61,5	4,0	1375-1385				370-650 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 800	0,9 bar 94,5-96,5 (92,5-98,5)		LDA 1200	0,9 bar 96,5-100,0 (94,0-102,0)	100	19,0-21,0 mm RW 140-180		
			LDA 500	0 bar 70,0-72,0 (68,0-74,0)	220-280 (210-290)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
RS 1107 RQV..MW 43-2	0,39		11,5 - 11,6
		0	10,4 - 10,5
		0,9	11,8 - 11,9
		0,17	10,7 - 10,8

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than $n = 500 \text{ min}^{-1}$.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 IHC 7,6 g

1. Edition
En

PES 6 MW 100/320 RS 1108

RQV 350-1200 MW 43-5

0 403 446 139

Nozzle-and-holder assembly
1 688 901 016 (207 + 3 bar)

supersedes

company: IHC

engine: DT 466 B

121,4 kW (165 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,00-3,10$
 $(2,95-3,15)$ mm (from BDC) $RW = 9,0 - 12,0$ mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	10,6+0,1	8,5-8,7	0,35(0,6)			
350	5,8-5,9	1,6-2,0	0,35(0,55)			
1200	10,6+0,1		0,65(0,7)			
500	9,2-9,3					

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel ①	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	8,0 0-1	1360-1400 1460	-	-	-	ca. 14	100 350	min. 9,0 5,8-5,9		
ca. 58,5	4,0	1360-1370				360-640 ③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 800	0,9 bar 85,0-87,0 (83,0-89,0)		LDA 1200	0,9 bar 90,5-94,5 (88,5-96,5)	100	19-21 mm RW 140-180		
			LDA 500	0 bar 59,0-61,0 (57,0-63,0)	220-280 (210-290)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at $n = 500$ rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
RS 1108 RQV.. MW 43-5	0,42		10,2 - 10,3
		0,9	10,6 - 10,7
		0	9,2 - 9,3
		0,18	9,5 - 9,6

Notes.

(1) when $n =$

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Please note:

- Carry out pump adjustment only with overflow valve 1 417 413 040 and IH hose with throttle 1.57 mm diameter.
- Set locking device before testing position of sliding device.
- In unlocked condition do not operate at a speed higher than $n = 500 \text{ min}^{-1}$.
- Set lower idle speed at stop screw.
- Set shutoff stop 1.5 - 2.0 mm in front of the stop.

Test Specifications Fuel Injection Pumps and Governors

PES 5 M 55 C 320 RS 108

RSF 350/2300 M 16

Komb. Nr. 0 400 075 994 ! Sales model

0 400 075 993

superseded 81

company Daimler Benz

engine OM 617

65 KW (88 PS)

1-2 - 4 - 5 -3

0 72 144 216 288 + 0 50 (0 75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 mm (from BDC) 20 mm Control rod travel
(2,15-2,35)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (compensating valve) mm
1	2	3	4	2	3	6
1000	13,9 ^{+0,1}	3,9-4,0	0,25(0,3)			
350	6,5-6,7	0,6-0,7	0,1(0,15)			
1800			0,25(0,3)			
2200			0,25(0,3)			

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min	Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min		Rotational speed rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
9-13	① min.10,5 ② max.10,0 ③ 6,5-6,7 ④ ** ⑤ 2,5	250 300 350 385 720-820	50	⑦ 13,0-13,2 ⑧ 9,1-9,5 ⑨ - ⑩ 0-1,0 ⑪	2200 2500 - 2950		⑫ 100 ⑬ 1800 ⑭ 1000 ⑥ Switching point	min.20,3 13,5-13,7 13,9-14,0

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery ①9		Full-load speed regulation ⑧a	Variations in fuel delivery ①7		Starting fuel delivery idle ①8		Difference
Test oil temp 40°C (104°F)							
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes
1	2	3	4	5	6	7	8
2200	39,5-41,5 (38,5-42,5)	2500 * RW 9,1-9,5	1800	39,0-41,0 (38,0-42,0)	100	min. 53,0	6,0 ⑫a
			1000	39,0-40,0 (38,0-41,0)	350	6,0-7,0 (5,5-9,0)	1,0 ⑮
					2500	23,0-27,0 (22,0-28,0)	1,5 ⑮ 2,5 see 8a ⑮ 3,0 point ⑮

Checking values in brackets

Caution: Control rod travel than in Column 2

12.82

Testoil-ISO 4113

1. ** Set the idle auxiliary spring at $n = 385 \text{ min}^{-1}$ so that the control-rod travel is exceeded by 0.1 - 0.2 mm.
2. Setting the idle control-lever position:
At 1000 min^{-1} , control rod travel 1.9 - 2.0 mm
3. Check the idle auxiliary spring shutoff
Control-lever position 47° . After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30° . Speed range $350 \text{ min}^{-1} - 450 \text{ min}^{-1}$
4. Check the pneumatic shutoff box
Control lever at idle stop.
At $n = 375 \text{ min}^{-1}$ and $p_u = 450 \text{ mbar}$ (vacuum) (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

Test Specifications

Fuel Injection Pumps and Governors

WPP 001/4 MB 3,0 o

2. Edition

En

PES 5 M 55 c 320 RS 108

RSF 350/2300 M 15

Komb.Nr. 0 400 075 995 Sales model

0 400 075 992

supersedes 1.81

company: Daimler-Benz

engine: OM 617

1-2 -4 -5 -3

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 mm (from BDC) 20 mm Control rod travel
(2,15-2,35)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (compensating valve) mm
1	2	3	4	2	3	6
1000	13,9 ^{+0,1}	3,9-4,0	0,25(0,3)			
350	6,5-6,7	0,6-0,7	0,1(0,15)			
1800			0,25(0,3)			
2200			0,25(0,3)			

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min	Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min		Rotational speed rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
9-13	① min. 10,5	250	50	⑦ 13,0-13,2	2200		⑫ 100	min. 20,3
	② max. 10,0	300		⑧ 9,1-9,5	2500		⑬ 1800	13,5-13,7
	③ 6,5-6,7	350		⑨ -	-		⑭ 1000	13,9-14,0
	④ **	385		⑩ 0,1,0	2950			
	⑤ 2,5	720-820		⑪ -	-		⑥ Switching point	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery ⑮		Full-load speed regulation ⑧a	Variations in fuel delivery ⑮		Starting fuel delivery idle		Difference
Test oil temp 40°C (104°F)							
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes
1	2	3	4	5	6	7	8
2200	39,5-41,5 (38,5-42,5)	2500* RW=9,1-9,5	1800	39,0-41,0 (38,0-42,0)	100	min. 53,0	6,0 ⑫a
			1000	39,0-40,0 (38,0-41,0)	350	6,0-7,0 (5,5-9,0)	1,0 (1,5) see ⑮
					2500	23,0-27,0 (22,0-28,0)	2,5 point 8a ⑮

Checking values in brackets

ca. 1 mm less control rod travel than in Column 2

12.82

Testoil-ISO 4113

1. ** Set the idle auxiliary spring at $n = 385 \text{ min}^{-1}$ so that the control-rod travel is exceeded by 0.1 - 0.2 mm.
2. Setting the idle control-lever position:
At 1000 min^{-1} , control rod travel 1.9 - 2.0 mm
3. Check the idle auxiliary spring shutoff
Control-lever position 47° . After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30° . Speed range $350 \text{ min}^{-1} - 450 \text{ min}^{-1}$
4. Check the pneumatic shutoff box
Control lever at idle stop.
At $n = 375 \text{ min}^{-1}$ and $p_u = 450 \text{ mbar}$ (vacuum) (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

Test Specifications

Fuel Injection Pumps and Governors

WPP 001/4 MB 2,0 h

2. Edition

En

PES 4 M 50 C 320 RS 103

RSF 375/2250 M 20

Komb. Nr. 0 400 074 976

1-3-4-2=0 - 90-180-270⁺0,5 (0,75)^o

Sales model

0 400 074 975

superseded 10.81

company Daimler Benz

engine OM 615

42,7 kW (58 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $1,70 - 1,80$ mm (from BDC) 20mm Control rod travel
 $(1,65 - 1,85)$

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (compensating valve) mm
1	2	3	4	2	3	6
1000	11,9+0,1	2,95-3,05	0,25(0,3)			
375	6,9-7,1	0,65-0,75	0,10(0,15)			

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min	Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min		Rotational speed rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
13-17	min. 12,5	250	50	11,2-11,4	2200		100	min. 20,3
(1)	6,9-7,1	375	(7)	8,1-8,5	2500		1900	11,4-11,6
(2)	**	400	(8)	-	-		1000	11,9-12,0
(3)	-	-	(9)	0,0-1,0	2950		(12)	
(4)	2,5	720-820	(10)	-	-		(13)	
(5)			(11)				(14)	
							(6)	Switching point

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery (19)		Full-load speed regulation (8a)	Variations in fuel delivery (17)		Starting fuel delivery (18)		Difference
Test oil temp 40°C (104°F)					Idle		
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes
1	2	3	4	5	6	7	8
2200	31,5-33,5 (30,5-34,5)	2500* RW 8,1-8,5	1900	32,0-34,0	100	min. 55,0	6,0 (12a)
				(31,0-35,0)	375	6,5-7,5	1,0
				29,5-30,5		(5,5-9,0)	1,5
			(28,5-31,5)	2500	17,0-21,0	2,5 see (15)	
					(16,0-22,0)	3,0 point 8a (16)	

Checking values in brackets

* 1 mm less control rod travel than in Column 2

12.82

1. ** Set the idle auxiliary spring at $n = 400 \text{ min}^{-1}$ so that the control-rod travel is exceeded by 0.1 - 0.2 mm.
2. Setting the idle control-lever position:
At 1000 min^{-1} , control rod travel 1.9 - 2.0 mm
3. Check the idle auxiliary spring shutoff
Control-lever position 47° . After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30° . Speed range $350 \text{ min}^{-1} - 450 \text{ min}^{-1}$
4. Check the pneumatic shutoff box
Control lever at idle stop.
At $n = 375 \text{ min}^{-1}$ and $p_u = 450 \text{ mbar}$ (vacuum) (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

Test Specifications Fuel Injection Pumps and Governors

PES 4 M 55 c 320 RS 107
RSF 375/2250 M 17

supersedes 9.81

company Daimler-Benz

engine OM 616

53 kW (72 PS)

Komb.Nr. 0 400 074 982 : Sales model

0 400 074 980

1-3 - 4 - 2
0-90-180-270

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,20-2,30 mm (from BDC) 20 mm Control rod travel
(2,15-2,35)

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (compensating valve)
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm
1	2	3	4	2	3	6
1000	13,9 ^{+0,1}	3,9-4,0	0,25(0,3)			
375	6,5-6,7	0,6-0,7	0,1(0,15)			
1800			0,25(0,3)			
2200			0,25(0,3)			

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel	Rotational speed	Degree of deflection of control lever	Control rod travel	Rotational speed		Rotational speed	Control rod travel
1	mm	rev/min	4	mm	rev/min	7	rev/min	mm
9-13	① min. 11,5	250	50	⑦ 13,0-13,2	2200		⑫ 100	min. 20,3
	② max. 11,0	300		⑧ 8,7-9,1	2500		⑬ 1800	13,3-13,5
	③ 6,5-6,7	375		⑨ -	-		⑭ 1000	13,9-14,0
	④ **	400		⑩ 0-1,0	2950			
	⑤ 2,5	720-820		⑪ -	-		⑥ Switching point	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery ⑬		Full-load speed regulation ⑧a	Variations in fuel delivery ⑮		Starting fuel delivery idle		Difference
Test oil temp 40°C (104°F)							
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes
1	2	3	4	5	6	7	8
2200	39,5-41,5 (38,5-42,5)	2500 * RW 8,7-9,1	1800	39,0-41,0 (38,0-42,0)	100	min. 53,0	6,0 ⑫a
			1000	39,0-40,0 (38,0-41,0)	375	6,0-7,0 (5,5-9,0)	1,0 ⑮
					2500	23,0-27,0 (22,0-28,0)	1,5 see point 8a ⑮
							2,5 ⑮
							3,0 ⑮

Checking values in brackets

ca. 1 mm less control rod travel than in Column 2

12.82

Testoil-ISO 4113

1. ** Set the idle auxiliary spring at $n = 400 \text{ min}^{-1}$ so that the control-rod travel is exceeded by 0.1 - 0.2 mm.
2. Setting the idle control-lever position:
At 1090 min^{-1} , control rod travel 1.9 - 2.0 mm
3. Check the idle auxiliary spring shutoff
Control-lever position 47° . After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30° . Speed range $350 \text{ min}^{-1} - 450 \text{ min}^{-1}$
4. Check the pneumatic shutoff box
Control lever at idle stop.
At $n = 375 \text{ min}^{-1}$ and $p_u = 450 \text{ mbar}$ (vacuum) (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 2,4 L

3. Edition

En

PES 4 M 55 C 320 RS 107

RSF 375/2250 M 18

Komb. Nr. 0 400 074 981 : Sales model

0 400 074 979

supersedes 9.81

company Daimler Benz

engine OM 616

53 kW (72 PS)

1- 3- 4 - 2

0-90-180-270

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $2,20-2,30$ mm (from BDC) Control rod travel
 $(2,15-2,35)$ 20mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (compensating valve) mm
1	2	3	4	2	3	6
1000	$13,9^{+0,1}$	3,9-4,0	0,25(0,30)			
375 1800 2200	6,5-6,7	0,6-0,7	0,1(0,15) 0,25(0,3) 0,25(0,3)			

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min	Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min		Rotational speed rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
9-13	① min. 11,5 ② max. 11,0 ③ 6,5-6,7 ④ ** ⑤ -	250 300 375 400 -	50	⑦ 13,0-13,2 ⑧ 8,7-9,1 ⑨ - ⑩ 0 - 1,0 ⑪ -	2200 2500 - 2950 -		⑫ 100 ⑬ 1800 ⑭ 1000	min. 20,3 13,3-13,5 13,9-14,0
	2,5	720-820					⑥ Switching point	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery ⑬		Full-load speed regulation ⑧a	Variations in fuel delivery ⑮		Starting fuel delivery idle		Difference cm ³ /1000 strokes
Test oil temp 40°C (104°F)							
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	8
1	2	3	4	5	6	7	
2200	39,5-41,5 (38,5-42,5)	2500* RW 8,7-9,1	1800	39,0-41,0 (38,0-42,0) 39,0-40,0 (38,0-41,0)	100	min. 53,0	6,0 ⑫a
			1000		375	6,0-7,0 (5,5-9,0)	1,0
					2500	23,0-27,0 (22,0-28,0)	1,5 2,5 see ⑮ 3,0 point 8a ⑮

Checking values in brackets

ca. 4,2 mm less control rod travel than in Column 2

12.82

1. ** Set the idle auxiliary spring at $n = 400 \text{ min}^{-1}$ so that the control-rod travel is exceeded by 0.1 - 0.2 mm.
2. Setting the idle control-lever position:
At 1000 min^{-1} , control rod travel 1.9 - 2.0 mm
3. Check the idle auxiliary spring shutoff
Control-lever position 47° . After change-over point up to 550 min^{-1} no change in control-rod travel. Control-lever position 30° . Speed range $350 \text{ min}^{-1} - 450 \text{ min}^{-1}$
4. Check the pneumatic shutoff box
Control lever at idle stop.
At $n = 375 \text{ min}^{-1}$ and $p_u = 450 \text{ mbar}$ (vacuum) (338 mmHg) the control rod must return quickly to control-rod travel = 0 mm.

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 PER 10,0 °

1. Edition
En

PES 8 MW 100/720 RS 1021 RQV 275-1125 MW 40
0 403 448 115

supersedes
company: Perkins
V8.640 GR
engine: 148 kW (201 PS)

1 - 8 - 7 - 5 - 4 - 3 - 6 - 2
0 - 45 - 90 - 135 - 180 - 225 - 270 - 315 ± 0,50 (0,75)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{3,00 - 3,10}{(2,95 - 3,15)}$ mm (from BDC) $RW = 9,0 - 12,0$ mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
800	10,7+0,1	9,05 - 9,25	0,35(0,6)			
275	6,2-6,4	1,35 - 1,75	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1190 1350	15,2-17,8 0 - 1,0	-	-	-	ca. 11	275 100 min. 7,7	6,2-6,4		
ca. 62	9,7 4,0	1175-1185 1220-1250				300-500 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
800	90,5 - 92,5 (88,5 - 94,5)	1175-1185*			100	min. 140,0		
					100-195 (80-215)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

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C by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

Port closing and TDC markings:

Comb. - No.
... 115

^ocamshaft between port-closing
and TDC
at control-rod travel 9,0 - 12,0 mm
15°

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 3,0 m

2. Edition
En

PES 5 MW 55/320 RS 16
RW 375/2200 MW 28-1
0 403 245 013
0 403 245 014 - Sales model

supersedes 2.80
company Daimler Benz
engine OM 617 A

Caution: Read important information on back before beginning testing.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,10-2,20 mm (from BDC) 21mm Control rod travel

Without ALDA (2,05-2,25)

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (compensating valve)
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm
1	2	3	4	2	3	6
1000	13,5+0,1	5,15 - 5,25	0,25(0,3)			
375	5,2-5,3	0,6 - 0,7	0,10(0,15)			
1600			0,25(0,3)			
2180			0,25(0,3)			

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Without ALDA

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel	Rotational speed	Degree of deflection of control lever	Control rod travel	Rotational speed		Rotational speed	Control rod travel
1	mm	rev/min	4	mm	rev/min	7	rev/min	mm
2	3		5	6			8	9
27-31	① min.11	100	69	⑦ 12,1-12,3	2180		⑫ 100	20,5-21,5
	② max.11	320		⑧ 11,0	2300-2320		⑬ 1500	13,1-13,3
	③ 5,2-5,3	375		⑨ 4,0	2620-2720		⑭ 1000	13,5-13,6
	④ -	-		⑩ 0,0-1,0	2950		⑥ Switching point	
	⑤ -	-					260-310(240-330)	

C. Settings for Fuel Injection Pump with Governor Mounted

Without ALDA

Full-load delivery		Full-load speed regulation		Variations in fuel delivery		Starting fuel delivery		
Test oil temp 40°C (104°F)						Idle		Difference
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes
1	2	3		4	5	6	7	8
2180	50,0-52,0 (49,0-53,0)	2300-2320* (2290-2330)		1600	51,5-53,0 (50,5-54,5)	100	min. 55,0	6,0
				1000	51,5-52,5 (50,5-53,5)	375	6,0 - 7,0 (5,5 - 9,5)	1,0 (1,5)
						2550	24,0-30,0 (23,0-31,0)	2,5 (3,0)

Checking values in brackets

* 1 mm less control rod travel than in Column 2

Testoil-ISO 4113

Testing with ALDA

MB 3.0 n

Point	min ⁻¹	cm ³ /1000 H	RW	Pressure (absolute)
18	1000	51,5 - 52,5 (50,5 - 53,5)	13,5 - 13,6	1733 mbar(1300 mmHg)
18a	*** 1000	41,0 - 43,0 (40,0 - 44,0)	-	1067 mbar(800 mmHg)
19	2180	50,0 - 52,0 (49,0 - 53,0)	12,1 - 12,3	1733 mbar (1300 mmHg)
12a	100	min. 55	20,5 - 21,5	1733 mbar (1300 mmHg)
15	375	6.0 - 7.0 (5.5 - 9.5)	5,2 - 5,3	987 mbar (740 mmHg)

1. Adjusting the idle

Test supersedes Section 4.1 of test instructions VDT-W-420/300
Suppl. 2, Ed. 2.

Set the control lever to an angle of 69°. Operate the fuel-injection pump at 1000 min⁻¹.

Screw in the spring retainer until a control-rod travel of 13,5 - 13,6 mm is reached.

Set the control lever to an angle of 49°. Operate the fuel-injection pump at 1000 min⁻¹. Control-rod travel 8,8 - 9,5 must be reached.

2. Adjusting the lower rated speed

Text supersedes Section 4.3 of test instructions VDT-W 420/300
Suppl. 2, Ed. 2.

Operate the fuel-injection pump at $n = 800 \text{ min}^{-1}$. Take back the control lever until a control-rod travel of 1.0 - 1.3 mm is reached.

The resulting deflection of the control lever must be within the allowable tolerance. Fix the control lever in this position. Drive the fuel-injection pump at a speed according to Point 2 Section B of the test specification sheet. Set regulation at adjusting screw (28).

3. Adjusting the idle-speed auxiliary spring (70)

- *** Position the idle-speed auxiliary spring in contact as the characteristic curve levels off at $n=520-550 \text{ min}^{-1}$.

4. Adjusting the sensing lever

Place the control lever against the full-load stop.

Operate the fuel-injection pump at $n = 375 \text{ min}^{-1}$. Adjust the sensing lever so that the control-rod travel is 0.1 (0.1 - 0.2) mm above the full-load control-rod travel at $n = 1000^{-1}$.

5. *** Correct the quantity of fuel injected at the correction screw of the ALDA aneroid box. Max. correction $\pm 0.75 \text{ mm}$ control-rod travel.

6. Pin projection = $16.65 \pm 0.1 \text{ mm}$

7. Shutoff check: Operate the fuel-injection pump at $n = 200 \text{ min}^{-1}$. Force the control rod through the spring-loaded idle stop. The resulting control-rod travel must be max. 5 mm.

8. Test the pneumatic shutoff: Control lever in idle position. Operate the fuel-injection pump at $n = 375 \text{ min}^{-1}$. At 450 mbar (338 mmHg) (vacuum) the control rod must move briskly to control-rod travel 0 mm.

9. Control-lever range idle - full load = $38 - 42^{\circ}$.

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 RVI 9,8 b 1

En

1. Edition

PE 6 P 120 A 321 RS 438 RQV 275-1200 PA 648

Values apply to
 engine nozzle-and-holder assemblies 1 688 901 019
 and engine fuel-injection tubing 1 680 750 067

supersedes

company RVI

engine: MID 062045

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

 Port closing at prestroke ^{3,5-3,6}
 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	11,2+0,1	13,4-13,7	0,5(0,9)			
275	5,3-5,5	0,7-1,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1230	15,2-17,8	-	-	-	ca. 11	100 275	min. 6,9 5,3-5,5	250 570 880 1200	0-0,9 4,7-5,0 6,1-6,3 8,3
ca. 65	10,2 4,0 1500	1240-1250 1335-1365 0-1,0				270-365 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1200	134,0-137,0 (131,0-140,0)	1240-1250*	-	-	100 275	180,0-200,0 7,0-13,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Distributor-type Fuel-injection Pumps

WPP 001/4 VWV 1,6v2

3. Edition

En

VE 4/9 F 1500 R 85-3

0 460 494 108

supersedes¹⁾ 6.82
company: VWV
engine: 50 Hz-Aggr.

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

-- mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1480	2,8-3,2 mm		
1.2 Supply pump pressure	1480	4,9-5,5 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1480	32,5-33,5 cm ³ /1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle speed regulation	425	6,0-10,0 cm ³ /1000 strokes		2,0 (3,0)
1.5 Start	100	min. 38,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1550	12,0-18,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	--	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,3-2,1 (1,0-2,4)	1480 (2,3-3,7)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,8-3,4	
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138 (40-153)	1500 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1630	max. 2,0	
	1550	(11,0-19,0)	
	1480	(30,7-35,3)	
	600	21,0-24,0 (19,5-25,5)	
switch-off	1500	0	
elect.	400	0	
Idle stop	600	max. 2,0	
	425	(4,0-12,0)	
End stop	400	min. 17,5	
	500	max. 23,0	
2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V XXXXXXX rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	mm
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	max. 2,5
+ FH	1,8-2,4
XK	18,4-20,4
XL	10,2-13,5

Observations

+ *operating
stroke (KSB)

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Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
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Test Specifications

Distributor-type Fuel-injection Pumps

WPP 001/4 Ope 1,6 d

2. Edition

En

VE 4/9 F 2300 R 82

O 460 494 071

supersedes 6.82

company: Opel

engine: 2033-1,6 L

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting - mm

see VDT-W-460/...

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	3,1-3,5 mm		
1.2 Supply pump pressure	1500	5,0-5,6 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	28,5-29,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	450	6,0-10,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Start	100	min. 42,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2640	17,0-23,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	1500	-		

2. Test Specifications checking values in brackets ()

2.1 Timing device	n = rev/min mm	1200 1,4-2,2(1,1-2,5)	1500 (2,6-4,0)	2300 6,8-7,6(6,5-7,9)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,4-3,0		2300 7,3-7,9
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138 (40-153)		2300 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)	Designation	for assembly and adjustment mm
End stop	3000 2800 2640 2300 2000 1500 600	max. 4,0 7,0-13,0 (6,0-14,0) (16,0-24,0) 27,2-29,6 (26,1-30,7) 27,0-29,0 (25,7-30,3) (26,7-31,3) 23,2-26,2 (21,7-27,7)		K KF MS SVS * FH	3,2-3,4 5,7-5,9 1,2-1,4 max. 2,0 1,8-2,4
switch-off	2300	0		^A XK ^B XL	24,2-26,2 9,9-13,2
Idle stop	1200 650 450	0 2,0-7,0 (0,5-8,5) (4,0-12,0)		Observations * *operating stroke (KSB)	
End stop	400 500	min. 30 max. 28			
2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V rated voltage xxx rated voltage 12V.				

3. Dimensions

BOSCH

 Geschäftsbereich KM Kundendienst Kfz-Ausrüstung
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12.82

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 1 g 1

2. Edition

En

PES3A85D410/3 RS 2642 RSV325-1150A8B2102-1L

1 - 3 - 2 je $120^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

supersedes: 6.82
company: KHD
engine: F3L 913
42 kW (57 PS)₁
2300 min
Tractor D 6007-S23

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{2,5-2,6}
(2,45-2,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,8+0,1	6,6-6,7	0,3 (0,45)			
325	8,9-9,1	1,7-2,3	0,2 (0,4)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 20	325	8,5	1150	11,5+0,1
X=									700	11,8+0,1
ca. 54									1075	11,6+0,3
⑤	10,2	1190-1200								
	4,0	1265-1295								
	1350	0,3-1,7								

** Set speed regulation before torque control.

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery Idle		5a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min							
rev/min 1	cm ³ /1000 strokes 2	3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
700	66,0-67,0 (64,0-69,0)	1190-1200	1150	70,5-73,5 (68,5-75,5)	100	133,5-143,5	5 -	-	

Checking values in brackets

* 1 mm less control rod travel than col. 2

9.82

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 PEN 12,0 d

1. Edition

En

PE 6 P 120 A 320 RS 3088 Z

RSV 200-900 P4/421 R

supersedes

company

engine

Volvo-Penta

TMD 120 B

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,6 - 2,7
(2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,7+0,1	19,4-19,8	0,5 (0,9)			
250	3,6-3,8	1,6-2,0	0,5 (0,8)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed			4 Lower rated speed Control-lever deflection in degrees 7			3 Torque control Control rod travel mm 11	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	rev/min 8	Control rod travel mm 9		rev/min 10	
loose	800	0,3-1,7	-	-	-	ca.22	250	3,2	-	-
	X = 4,0						100	min.20,0		
ca.53	10,7	940- 950					250	3,6-3,8		
	4,0	970-1000					300-360	= 2,0		
2a	1130	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		6 Rotational-speed limit Note: changed to ... rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 4a Idle stop Control rod travel mm 9	
cm ³ /1000 strokes 2				cm ³ /100 strokes 5		cm ³ /1000 strokes 7		rev/min 8	
700	194,0-198,0 (192,0-200,0)	940-950*	900	218,0-222,0 (215,0-225,0)	100	390-440 = 20,0- 21,0 mmRW		250	3,7

Checking values in brackets

* 1 mm less control rod travel than col 2

12.82

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C10

C10

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 k

2. Edition

En

PE 12A 95D 610LS 2453 RQV 300-1150 AB 1083 L

supersedes 9.82

company: KHD

engine: F 12 L 413 F

260 kW(352PS)

bei 2300 min⁻¹1 - 4 - 9 - 8 - 5 - 2 - 11 - 10 - 3 - 6 - 7 - 12
0 -15 -60 -75 -120-135-180 -195 -240-255-300-315^{+0,5°} (^{+0,75°})

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15)
2,00-2,10 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	9,5-9,6	8,8 - 9,0	0,3(0,6)			
300	6,4-6,6	1,6 - 2,2	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca.16	100 300 640-700=2,0	min.8,0 6,4-6,6	300 750 1190	1,4-1,6 4,0-4,3 8,5
ca.66	8,5 4,0 1400	1190-1200 1240-1270 0 - 1,0				320-400 (3a)				

Torque control travel a = 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel Control rod travel ⑤	
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	9
1150	87,5 - 89,5 (85,5 - 91,5)	1190-1200*	1000	87,0-90,0 (85,0-92,0)	100	120 - 130 bei 14,3 - 14,7 mm RW	1100	9,5-9,6
			700	88,0-91,0 (85,0-92,0)			945	9,5-9,8
							800	9,8-10,0
							700	9,9-10,0
							400	9,9-10,0
					100-220 (80-240)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

C11

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 6,1 i

3. Edition

En

supersedes 9.82

company: KHD

engine: BF 6 L 913 T
96 kW bei 2500 min⁻¹

PES 6 A 85 D 410/3 RS 2415

RQV 300-1250 AB 1131 L

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{1,9-2,0}
(1,85-2,05) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	12,0+0,1	7,8 - 7,9	0,3(0,45)			
300	8,4-8,6	0,9 - 1,5	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1385	15,2-17,8	-	-	-	ca. 17	100 300	min.10,0 8,4-8,6	250 580	0,9-1,1 3,9-4,1
ca. 65	11,0 4,0 1525	1290-1300 1415-1445 0-1,0				450-550 (3a)	645-705=2,0		920 1250	5,4-5,6 7,8

Torque control travel = 0,9 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational-speed limitation intermediate speed 4a	Fuel delivery characteristics high idle speed 5a		Starting fuel delivery idle switching point 6		Torque-control travel 5	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1250	78,0 - 79,0 (76,0 - 81,0)	1290-1300 *	800	69,5-71,5 (67,5-73,5)	100	105,0-115,0 bei 17,4-17,8 mm RW	1250 8600 850	12,0+0,1 12,8+0,1 12,3+0,2

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SSC 38,1 a
1. Edition

En

PE 12 P 110 A 520/6 LS 3090-1 RQV 300-750 PA 614

supersedes

company SSCM

1 - 8 - 5 - 10 - 3 - 7 - 6 - 11 - 2 - 9 - 4 - 12
0 - 37,5 - 60 - 97,5 - 120 - 157,5 - 180 - 217,5 - 240 - 277,5 - 300 - 337,5° ± 0,5° (± 0,75°)

530 kW (720 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,8 - 2,9}{(2,75 - 2,95)}$ mm (from BDC) = RW 9,0 - 12,0 mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
750	13,3+0,1	24,6-24,9	0,4 (0,8)			
300	4,7-4,9	1,8-2,4	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	780	15,2-17,8	-	-	-	ca. 10	100	min. 6,3	250	0,2-0,6
ca. 66	12,3	790-800					300	4,7-4,9	420	3,4-3,7
	4,0	835-865						325-385=2,0	580	5,2-5,4
	1000	0-1,0							750	8,0
						③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
750	246,0-249,0 (243,0-252,0)	790-800*	-	-	100	19,5-21,0 mmRW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

Testoil-ISO 4113

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C13

C13

①

Test Specifications

Fuel Injection Pumps ① and Governors

WPP 001/4 SSC 19,0 a

1. Edition

En

PES 6 P 130 A 520 LS 3091

RQV 300-750 PA 614

supersedes

company SSC M

engine: Poyaud - L 685
368 kW (500 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 - 2,9$ mm (from BDC) = RW 9,0 - 12,0 mm
(2,75-2,95)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
750	14,7+0,1	44,5-44,9	0,4 (0,8)			
300	5,5-5,7	2,2-2,8	0,4 (1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	780	15,2-17,8	-	-	-	ca. 11	100 300	min. 7,1 5,2-5,4	250 420 580 750	0,3-0,6 3,3-3,7 5,1-5,4 8,0
ca. 66	13,7 4,0 1000	790-800 850-880 0-1,0				325-435				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min	cm³/1000 strokes	rev/min ④a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
750	445,0-449,0 (442,0-452,0)	790-800*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

Testoil-ISO 4113

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 VWV 2,4 d

1. Edition

En

VE 6/10 F 2400 L 116-1

0 460 406 019

supersedes

company VWV

engine: 087- T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

-

mm

see VDT-W-460/.

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	1,4-1,8 mm	0,75	
1.2 Supply pump pressure	1500	5,7-6,3 bar (kgf/cm ²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	26,5-27,5 cm ³ /1000 strokes	0	
Full-load delivery with charge-air pressure	1500	44,0-45,0 cm ³ /1000 strokes	0,75	3,0
1.4 Idle speed regulation	375	6,0-10,0 cm ³ /1000 strokes	0	3,0
1.5 Start	~ 100	min. 42,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	2600	10,0-16,0 cm ³ /1000 strokes	0,75	
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	1200	1500	2400
LDA=0,75 bar	mm	0,2-1,0(0-1,3)	(0,9-2,3)	4,1-4,9(3,8-5,2)
2.2 Supply pump	n = rev/min	600	2400	
LDA=0,75 bar	bar (kgf/cm ²)	3,3-3,9	8,1-8,7	
Overflow delivery	n = rev/min	600	2400	
	cm ³ /10 s	55-138(40-153)	55-138(40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2750	max. 4,0	0,75
	2600	(9,0-17,0)	0,75
	2400	35,5-37,5 (34,2-38,8)	0,75
	1500	(42,2-46,8)	0,75
	* 800	33,5-34,5 (31,0-37,0)	0,30
	600	(24,0-30,0)	0
switch-off mech.	2400	0	
elektr.	400	0	
Idle stop	375	(4,0-12,0)	
	600	max. 3,0	
End stop	400	min. 20	
	500	max. 30	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	2,4
KK	21,8-23,8
XL	9,4-12,7

Observations

Manifold-pressure
compensator stroke
= 4,2 mm.
Correction at the
adjusting nut (46)

2.4 Solenoid max. cut-in voltage xxx min 10 V
rated voltage 12V.

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Test Specifications

Distributor-type

Fuel-injection Pumps

46

WPP 001/4 VWV 2,4 b

1. Edition

En

VE 6/10 F 2400 L 116-2

0 460 406 020

supersedes -

company: VWV

engine: 087 T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	1,5 - 1,9 mm	0,75	
1.2 Supply pump pressure	1500	5,7 - 6,3 bar (kgf/cm ²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	25,5 - 26,5 cm ³ /1000 strokes	0	
Full-load delivery with charge-air pressure	1500	44,0 - 45,0 cm ³ /1000 strokes	0,75	3,0
1.4 Idle speed regulation	375	6,0 - 10,0 cm ³ /1000 strokes	0	3,0
1.5 Start	100	min. 42,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	2600	10,0 - 16,0 cm ³ /1000 strokes	0,75	
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA = 0,75bar	n = rev/min mm	1200 0,2-1,0(0-1,3)	1500 (1,0-2,4)	2400 5,4-6,2(5,1-6,5)
2.2 Supply pump LDA = 0,75bar	n = rev/min bar (kgf/cm ²)	600 3,3-3,9	2400 8,1-8,7	
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)	2400 55-138(40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2750 2600 2400 1500 * 800 600	max. 4,0 (9,0-17,0) 35,0-37,0 (33,7-38,3) (42,2-46,8) 32,5-33,5 (30,0-36,0) (23,0-29,0)	0,75 0,75 0,75 0,75 0,30 0
switch-off elect.	400	0	
Idle stop	375 600	max. 3,0 (4,0-12,0)	
End stop	400 500	min. 20,0 max. 30,0	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	2,4
AK	21,8-23,8
AL	9,4-12,7

Observations

Manifold-pressure
compensator stroke
= 4,2 mm.
Correction at the
adjusting nut (46)

2.4 Solenoid
max. cut-in voltage xxx min. 10 V
xxxxxxx rated voltage 12V.

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12.82

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 VWV 2,4 a

1. Edition

En

VE 6/10 F 2400 L 116

0 460 406 018

supersedes

company/VWV

engine: 087- T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/.

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	1,4 - 1,8 mm	0,75	
1.2 Supply pump pressure	1500	5,7 - 6,3 bar (kgf/cm ²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	26,5 - 27,5 cm ³ /1000 strokes	0	
Full-load delivery with charge-air pressure	1500	44,0 - 45,0 cm ³ /1000 strokes	0,75	3,0
1.4 Idle speed regulation	375	6,0 - 10,0 cm ³ /1000 strokes	0	3,0
1.5 Start	100	min. 42,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	2600	10,0 - 16,0 cm ³ /1000 strokes	0,75	
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	1200	1500	2400
LDA=0,75bar	mm	0,2-1,0(0-1,3)	(0,9-2,3)	4,1-4,9(3,8-5,2)
2.2 Supply pump	n = rev/min	600	2400	
LDA=0,75bar	bar (kgf/cm ²)	3,3-3,9	8,1-8,7	
Overflow delivery	n = rev/min	600	2400	
	cm ³ /10 s	55-138(40-153)	55-138(40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2750 2600 2400 1500 ★ 800 600	max. 4,0 (9,0-17,0) 35,5-37,5 (34,2-38,8) (42,2-46,8) 33,5-34,5 (31,0-37,0) (24,0-30,0)	0,75 0,75 0,75 0,75 0,30 0
switch-off électr.	400	0	
Idle stop	375 600	(4,0-12,0) max. 3,0	
End stop	400 500	min. 20,0 max. 30,0	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	2,4
✱K	21,8-23,8
✱L	9,4-12,7

Observations

Manifold-pressure
compensator stroke
= 4,2 mm.
Correction at the
adjusting nut (46)

2.4 Solenoid	max. cut-in voltage xxx min. 10 V rated voltage 12V.
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12.82

Test Specifications

Distributor-type Fuel-injection Pumps

WPP 001/4 VMA 2,2a

En

3. Edition

VE 4/10 F 2100 L 75
0 460 404 024

superseded by 0.02
company: VM-Motori
engine: HR 492 HT

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting - mm

see VDT-W-460/.

Testoil-ISO 4113

1. Settings	Rot speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1600	6,3- 6,7 mm	0,7	
1.2 Supply pump pressure	1600	5,8- 6,4 bar (kgf/cm ²)	0,7	
1.3 Full-load delivery without charge-air pressure	1600	31,5-34,5 cm ³ /1000 strokes	0	
Full-load delivery with charge-air pressure	1600	47,5-48,5 cm ³ /1000 strokes	0,7	2,5 (3,0)
1.4 Idle speed regulation	400	15,0-19,0 cm ³ /1000 strokes	0	2,5 (3,0)
1.5 Start	100	min. 65,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	2300	24,5-30,5 cm ³ /1000 strokes	0,7	
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA=0,7 bar	n = rev/min mm	1000 1,9-2,7(1,6-3,0)	1600 (5,8-7,2)	2100 9,3-9,9(8,9-10,3)
2.2 Supply pump LDA=0,7 bar	n = rev/min bar (kgf/cm ²)	400 1,5-2,1		2100 7,5-8,1
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)		2100 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2450	max. 5,0	0,7
	2300	(23,5-31,5)	0,7
	2100	41,5-44,5(40,7-45,3)	0,7
	1600	(30,7-35,3)	0
	1600	(45,7-50,3)	0,7
	* 700	43,0-46,0(41,5-47,5)	0,3
	600	34,0-37,0(32,5-38,5)	0
switch-off	2100	0	
Idle stop	550-750 400	0 (13,0-21,0)	
End stop	350 500	min. 37,0 max. 37,0	

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2- 3,4
KF	5,7- 5,9
MS	1,4- 1,6
SVS	4,4- 4,6
* FH	1,8- 2,4
XK	20,2-22,2
XL	10,0-13,3

Observations

Manifold-pressure
compensator stroke
= 4,2 mm.
Correction at the
adjusting nut (46)

2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V idle voltage xxx rated voltage 12V.
--------------	--

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Test Specifications

Distributor-type Fuel-injection Pumps

WPP 001/4 PEU 2,3e

2. Edition

En

VE 4/10 F 2075 R 67

0 460 404 012

supersedes 6.82

company: Peugeot

engine: XD 2 S - US

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting -- mm

see VDT-W-460/...

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	5,0-5,4 mm	0,8	
1.2 Supply pump pressure	1500	5,4-6,0 bar (kgf/cm ²)	0,8	
1.3 Full-load delivery without charge-air pressure	600	36,0-39,0 cm ³ /1000 strokes	0	2,5(3,0)
Full-load delivery with charge-air pressure	1125	48,7-49,7 cm ³ /1000 strokes	0,8	
1.4 Idle speed regulation	390	8,0-12,0 cm ³ /1000 strokes	0	2,5(3,0)
1.5 Start	100	min. 53,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	2400	9,5-15,5 cm ³ /1000 strokes	0,8	
1.7 Load-dependent start of delivery	--	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	600	1000	1500	2000
LDA=0,8 bar	mm	1,3-2,1(1,0-2,4)	2,9-3,5(2,5-3,9)	(4,5-5,9)	6,9-7,7(6,6-8,0)
2.2 Supply pump	n = rev/min	400			2075
LDA=0,8 bar	bar (kgf/cm ²)	1,6-2,2			7,6-8,2
Overflow delivery	n = rev/min	500			2075
	cm ³ /10 s	55-110(40-125)			55-110(40-125)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2450	max. 9,0	0,8
	2400	(7,5-16,5)	0,8
	2300	25,5-31,5 (24,5-32,5)	0,8
	2000	44,3-46,7 (43,2-47,8)	0,8
	1400	50,6-53,0 (49,5-54,1)	0,8
	1125	(46,9-51,5)	0,8
	+ 750	42,3-43,3 (39,8-45,8)	0,25
	600	36,0-39,0 (34,5-40,5)	0

switch-off

2075

0

Idle stop

450-550
3900
(6,0-14,0)

End stop

400
500

2.4 Solenoid

 max. cut-in voltage xxx min. 10,0 V
 rated voltage 12V.

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-5,9
MS	0,9-1,1
SVS	max. 1,4
KK	20,2-22,2
KL	8,8-12,2

Observations

 Manifold-pressure
 compensator stroke
 =4,5 mm
 Correction at the
 adjusting nut (46)

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VW 2,3 b

3. Edition

En

VE 6/10 F 2400 L 32-1 (P)

0 460 406 009; 010

supersedes 6.82

company: VW

engine: 087/10 Autom.

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,8 - 3,2 mm		
1.2 Supply pump pressure	1500	5,2 - 5,8 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	28,5 - 29,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	350	10,0 - 14,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Start	100	min. 42,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2600	15,0 - 22,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 0,8-1,6(0,5-1,9)	1500 (2,3-3,7)	2400 6,0-6,8(5,7-7,1)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,8-3,4		2400 7,7-8,3
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)		2400 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2700 2600 2400 1500 750	6,0-12,0 (14,5-22,5) 22,0-24,0 (20,7-25,3) (26,7-31,3) 26,0-29,0 (24,5-30,5)	
switch-off	2400	0	
Idle stop	400 350	3,0-9,0 (8,0-16,0)	
End stop	400 500	min. 20 max. 25	
2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,4-6,6
MS	1,4-1,6
SVS	max. 3,0
XX	18,5-20,5
XL	9,2-12,9

Observations

Stop check (lever)
at n = 2400 min⁻¹

Testoil-ISO 4113

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10.82

C20

C20

①

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 RVI 9,8 b

1. Edition

En

PE 6 P 120 A 321 RS 438

RQV 275-1200 PA 538

supersedes_

company: RVI

engine: MID 062045

152 kW (206 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

 Port closing at prestroke ^{3,5 - 3,6}
 (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	10,6+0,1	14,7-15,1	0,5(0,9)			
275	5,3-5,5	0,7-1,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 10	100 275	min.6,9 5,3-5,5	250 570 880 1200	0,4-0,7 3,7-3,9 5,3-5,5 8,0
ca. 64	9,6 4,0 1450	1240-1250 1310-1340 0-1,0				280-390 ③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1200	147,0-151,0 (144,0-154,0)		-	-	100	180,0-200,0	-	-
					275	7,0-13,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

C21

C21

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①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 9,5 a 3

1. Edition

En

PES 5 P 110 A 820 LS 434 RQV 300-1100 PA 594-1

supersedes

company Daimler Benz

engine OM 409

135 kW (184 PS)

1 - 3 - 5 - 4 - 2 je $72^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,0-3,1$
 $(2,95-3,15)$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,4+0,1	11,0-11,2	0,4(0,8)			
300	7,6-7,8	1,2-1,8	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca. 34	100 300	min. 8,5 7,0-7,2	250 530 820 1100	1,0-1,3 3,9-4,2 5,5-5,8 8,2
ca. 64	9,4 4,0 1300	1140-1150 1175-1205 0 - 1,0				320-435				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational speed limitation intermediate speed 2b	Fuel delivery characteristics high idle speed 5b		Starting fuel delivery idle switching point 6		Torque-control travel 5	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1100	110,0-112,0 (107,0-115,0)	1140-1150*	600	93,0-97,0 (90,0-100,0)	100	130,0-150,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 11,41

2. Edition

En

Testoil-ISO 4113

PES 6 P 110 A 820 LS 442

RQV 300-1100 PA 594-2

supersedes 81

company Daimler-Benz

engine: OM 407 h

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,2 - 3,3$ mm (from BDC) Zyl. 6
 (3,15-3,35)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,3+0,1	12,5 - 12,7	0,4(0,8)			
300	7,7-7,9	1,3 - 1,9	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca. 40	100	min. 9,4	250	1,0-1,3
ca. 62	10,3 4,0 1300	1140-1150 1175-1205 0 - 1				320-450	300	7,7-7,9	550 800 1100	4,0-4,3 5,3-5,7 8,1

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control ⑤ travel Control rod travel	
rev/min	cm ³ /1000 strokes	rev/min ④a	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	9
1100	125,0-127,0 (122,0-130,0)	1140-1150 *	600	108,0-112,0 (105,0-115,0)	100	130,0-150,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

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C23

C23

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 11,4 L3

2. Edition

En

Testoil-ISO 4113

PES 6 P 110 A 820 LS 442

ROV 300-1100 PA 594-3

supersedes 2.82

company: Daimler-Benz

engine: OM 407

162 kW (220 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,2-3,3$ mm (from BDC) Zyl. 6
(3,15-3,35)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,0+0,1	11,6 - 11,8	0,4(0,8)			
300	7,8-8,0	1,4 - 2,0	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca.32	100 300	min. 9,0 7,3-7,5	250 530	1,0-1,3 3,9-4,2
ca. 60	10,0 4,0 1300	1140-1150 1175-1205 0 - 1,0				320-450 ③a			820 1100	5,5-5,8 8,1

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed ②b limitation intermediate speed 4a	Fuel delivery characteristics 5a high idle speed 5b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1100	116,0-118,0 (113,0-121,0)	1140-1150*	600	103,0-107,0 (100,0-110,0)	100	130,0-150,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 HAN 7,2 b

1. Edition

En

PE 4 A 95 D 420 RS 2662 RSV 350-1100 A 8 B 1120 DR

supersedes-

company Hanomag

engine D 943 A 1

Use overflow valve 1 417 411 000

** Test cold-start device according to VDT-DAF-004, page 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25
(2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,3+0,1	11,0-11,2	0,3(0,6)			
350	6,4-6,6	1,1-1,7	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 19	350	6,0	1100	11,3-11,4
	x =	3,75					100	min. 19,5	500	11,8-11,9
ca. 49	10,3	1140-1150					350	6,4-6,6	980	11,4-11,6
2a	4,0	1195-1225					490-550	= 2,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min							
rev/min 1	cm ³ /1000 strokes 2	3	4	5	6	7	8	9	
1100	109,5-111,5 (107,5-113,5)	1140-1150*	500	104,0-107,0 (102,0-109,0)	100	19,5-21,0 mm RW **			

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

D1

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Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 FIA 12,9 a

2. Edition

En

supersedes 2.81

company Fiat

engine 8260.02

Testoil-ISO 4113

PE 6 P 120 A 720 LS 3803 RQ 300/1200 PA356
Testing with T nozzles and fuel lines 8 x 2 x 1000
according to ..W 400/305

1 - 6 - 5 - 4 - 3 - 2 $\pm 0,50^0$
0 - 75 - 120 - 195 - 240 - 315 $(\pm 0,75^0)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\begin{matrix} 3,50-3,60 \\ (3,45-3,65) \end{matrix}$ mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1200	9,3-9,4	17,3 - 17,7	0,5(0,9)			
300	5,9-6,1	2,8 - 3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min	Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications rev/min	Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
650	15,6-16,4	650	16,0	8,3	1245-1260	300	6,0	100	min 7,5	1200	9,3-9,4
				4,0	1280-1310			300	5,9-6,1	650	9,3-9,5
				1400	0 - 1,0			400-440	=2,0		

Torque-control travel
on flyweight assembly dimension a = - mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /100 strokes
1	2	3	4	5	6	7
1200	173,0 - 177,0 (170,0 - 180,0)	-	-	-	100	19,5-21 mm RW
					300	28,0-36,0

Checking values in brackets

1.83

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Test Specifications Fuel Injection Pumps ①A and Governors

40

WPP 001/4 MB 9,5 a 5

1. Edition

En

PES 5 P 110 A 820 LS 434 RSV 350-1100 P0/485

1 - 3 - 5 - 4 - 2 je 72° ± 0,5° (± 0,75°)

supersedes

company Daimler-Benz

engine OM 409

137 kW (186 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 - 3,1
(2,95-3,15) mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1080	10,9+0,1	12,0-12,2	0,4 (0,8)			
350	6,8-7,0	1,1-1,7	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	-	-	-	-	-
	x = 2,25									
ca. 34	9,9	1120-1130								
②a	4,0	1180-1210								
	1300	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp 40°C (104°F)		Note: changed to rev/min				Idle		Control rod travel mm	
rev/min	cm ³ /1000 strokes	3		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2			4	5	6	7	8	9
1080	120,0-122,0 (117,0-125,0)	1120-1130*	-	-	-	100	130,0-150,0	0	-

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

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D3

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 FOR 5,9 f 3

En

1. Edition

PES 6 A 90 D 210 RS 2629

RSV 350-1300 A0B 2139 L

supersedes -

company: Ford GB

engine: 380

Testoil-ISO 4113

At port closing the locating pin must engage in the slot the pointer.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,7 - 2,8$ mm (from BDC)
(2,65-2,85)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1250	12,9+0,1	7,2 - 7,3	0,3(0,45)			
350	6,4-6,5	0,9- 1,3	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 34	350	6,0	-	-
	x =	2,75					100	min.19,0		
ca. 68	11,9	1365-1375					350	6,4-6,6		
⑤	4,0	1505-1535					515-575	=2,0mm		
	1670	0,3 - 1,7					650	max. 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min							
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1250	72,0-73,0 (70,0-75,0)	1365-1375 *	-	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

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Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 UNI 9,6 b1

1. Edition

En

PES 6 P 110 A 820 RS 424 RQ 275/1300 PA 573

supersedes—

company: IVECO-UNIC

engine: 8220-02

148 kW (204 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,15-2,35) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1300	10,5+0,1	9,5-9,7	0,4(0,8)			
275	4,9-5,1	1,2-1,8	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2		Control rod travel mm 4		Test specifications Control rod travel mm 5		Control rod travel mm 8		Test specifications Control rod travel mm 10		Control rod travel mm 12	
600	15,6-16,4	600	16,0	9,5 4,0 1550	1345-1360 1410-1440 0 - 1,0	275	5,0	100 275 360-400=	min. 6,5 4,9-5,1 2,0	1300 600	10,5-10,6 10,5-10,7

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1345-1360 min

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes/mm 7	
1300	95,0-97,0 (92,0-100,0)	-	-	-	-	100	140,0-160,0

Checking values in brackets

Test Specifications

Distributor-type Fuel-injection Pumps

WPP 001/4 PER 5,8e

1. Edition

En

VE 6/12 F 1300 L 107

0 460 406 027

 Nozzle-and-holder assembly company: Perkins
 1 688 901 020 (172 + 3 bar) engine: T 6.354.4

supersedes -

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

Pre-stroke setting 0,35 mm +0,02 (0,04)

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	-	- mm	-	
1.2 Supply pump pressure	1000	4,2-4,8 bar (kgf/cm ²)	0,75	
1.3 Full-load delivery without charge-air pressure	500	67,0-71,0 cm ³ /1000 strokes	0	
Full-load delivery with charge-air pressure	1000	95,5-96,5 cm ³ /1000 strokes	0,75	3,5
1.4 Idle speed regulation	200	8,0-12,0 cm ³ /1000 strokes	0	3,5
1.5 Start	100	min. 90,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	1450	32,0-38,0 cm ³ /1000 strokes	0,75	
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	blockiert	
2.2 Supply pump LDA=0,75bar	n = rev/min bar (kgf/cm ²)	400 2,0-2,6	1300 5,8-6,4
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)	1300 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1600 1550 1450 1250 1000 * 600 500	0 1,0-9,0 (0 -10,0) (30,0-40,0) 90,0-93,0 (88,5-94,5) (93,0-99,0) 85,0-87,0 (83,0-89,0) (65,3-72,7)	0,75 0,75 0,75 0,75 0,75 0,32 0
switch-off	1300	0	
Idle stop	200 300 450	(5,0-15,0) max. 7,0 0	
End stop	150 250	min. 90,0 max. 65,0	

3. Dimensions

Designation	for assembly and adjustment mm
K	-
KF	5,2-5,3
MS	1,2-1,3
SVS	max. 1,2
KK	20,2-22,2
KL	8,4-11,7

Observations

* Manifold-pressure compensator stroke = 4,5 mm.
Correction at the adjusting nut (46)

Test Specifications

Distributor-type

Fuel-injection Pumps

WWP 001/4 PER 5,8c2

2. Edition

En

VE 6/12 F 1300 L 21-3
0 460 426 022

Nozzle-and-holder assembly company: Perkins
1 688 901 020 (172 + 3 bar) engine: T 6.354.4

supersedes 4.82

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting — mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	600	2,2-2,8 mm	0,74	
1.2 Supply pump pressure	800	4,4-5,0 bar (kgf/cm ²)	0,74	
1.3 Full-load delivery without charge-air pressure	1000	70,5-73,5 cm ³ /1000 strokes	0	2,5(3,0)
Full-load delivery with charge-air pressure	1000	95,5-96,5 cm ³ /1000 strokes	0,74	
1.4 Idle speed regulation	270	8,0-12,0 cm ³ /1000 strokes	0	2,5(3,0)
1.5 Start	100	min. 80,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	1480	47,0-53,0 cm ³ /1000 strokes	0,74	
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	400	600	800
LDA=0,75bar	mm	0,4-1,2(0,1-1,5)	(1,8-3,2)	3,8-4,6(3,5-4,9)
2.2 Supply pump	n = rev/min	400		1300
LDA=0,75bar	bar (kgf/cm ²)	2,7-3,3		6,5-7,1
Overflow delivery	n = rev/min	500		1300
	cm ³ /10 s	55-111(40-126)		55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1550	max. 12,0	0,74
	1480	(46,0-54,0)	0,74
	1300	86,0-88,0	0,74
	1000	(69,7-74,3)	0
	1000	(93,7-98,3)	0,74
	* 700	82,0-84,0	0,20
	500	66,5-69,5	0
switch-off	1300	0	
Idle stop	330-410	0	
	270	(6,0-14,0)	
End stop	120	min. 80	
	230	max. 75	
2.4 Solenoid	max. cut-in voltage		
	test voltage		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,1-5,3
MS	0,9-1,1
SVS	max. 6,0
X _K	20,2-22,2
X _B	11,7-15,1

Observations

* Manifold-pressure
compensator stroke
= 4,5 mm.
Correction at the
adjusting nut (46)

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Test Specifications

Distributor-type Fuel-injection Pumps

WVP 001/4 PER 5,8 c4

2. Edition

En

VE 6/12 F 1300 L 21-2

0 460 426 013

 Nozzle-and-holder assembly
 1 688 901 020 (172 + 3 bar)

 supersedes 9.82
 company: Perkins
 engine: T6.354.4

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,45 mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	600	2,5-2,9 mm	0,65	
1.2 Supply pump pressure	600	3,8-4,4 bar (kgf/cm ²)	0,65	
1.3 Full-load delivery without charge-air pressure	1000	78,5-82,5 cm ³ /1000 strokes	0	
Full-load delivery with charge-air pressure	1000	92,5-93,5 cm ³ /1000 strokes	0,65	3,0(3,5)
1.4 Idle speed regulation	270	8,0-12,0 cm ³ /1000 strokes	0	3,0(3,5)
1.5 Start	100	min. 78,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	1480	42,0-50,0 cm ³ /1000 strokes	0,65	
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	400	600	800
LDA = 0,65 bar	mm	0,7-1,5(0,4-1,8)	(2,0-3,4)	3,8-4,6(3,5-4,9)
2.2 Supply pump	n = rev/min	400		1300
LDA = 0,65 bar	bar (kgf/cm ²)	3,0-3,6		6,0-6,6
Overflow delivery	n = rev/min	500		1300
	cm ³ /10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1550	max. 9,0	0,65
	1480	(41,0-51,0)	0,65
	1300	86,5-89,5 (83,0-93,0)	0,65
	1000	(90,0-96,0)	0,65
	1000	(77,5-83,5)	0
	* 700	84,5-88,5 (83,5-89,5)	0,32
	500	68,5-72,5 (66,8-74,2)	0
switch-off	1300	0	
Idle stop	330-420	0	
	270	(5,0-15,0)	
End stop	150	min. 78	
	230	max. 75	
2.4 Solenoid	max. cut-in voltage		
	test voltage		

3. Dimensions

for assembly and adjustment mm

Designation	
K	
KF	5,1-5,4
MS	0,9-1,1
SVS	max. 6,0
*K	20,2-22,2
*L	12,5-15,8

Observations

* Manifold-pressure compensator stroke = 4,0 mm.
Correction at the adjusting nut. (46)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 SCA 11,0 r 4
3. Edition:

En

PE 6 P 110 A 720 RS 3040 RSV 350-1100 P1/481

supersedes 10.81
company Scania
DS 11
engine Tractor

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,3-3,4$
(3,25-3,45) mm (from BDC) = RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	12,3+0,1	15,8-16,0	0,4(0,8)			
350	3,6-3,8	0,9-1,3	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 26	350	3,2		
	x =	2,75					100	min. 20,0		
							350	3,6-3,8		
							400-460	= 2,0		
ca. 51	11,9	1140-1150								
2a	4,0	1190-1220								
	1350	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min				Idle			
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1100	158,0-160,0 (155,0-163,0)	1140-1150*		600	159,0-163,0 (156,0-166,0)	100	210,0-260,0 = RW 20,0- 21,0 mm	-	-
						350	9,0-13,0		

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

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Testoil-ISO 4113

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 5,7 v 9

2. Edition

En

PES 6 A 90 D 410 RS 2596

RSV 350-750 AOB 741 L

superseded 8.82

company Daimler-Benz

engine: OM 352 A

65 kW (88 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $2,0 - 2,1$ mm (from BDQ) RW $9,0 - 12,0$ mm
 (1,95-2,15)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
700	13,0+0,1	6,6 - 6,7				
100	-	7,8 - 8,8				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	500	0,3-1,0	-	-	-	ca. 14	350	8,1	-	-
	x =						100	min.19,0 **		
⑤ ca. 26	12,0	750-755					360-420	= 2,0		
	4,0	788-801								
	850	0,3-1,7								

The numbers denote the sequence of the tests. Set auxiliary idle spring at 2.0 mm control-rod travel.

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min							
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	
700	65,5-66,5 (63,5-68,5)	750-755*	-	-	100	71,0-81,0	-	-	

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

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Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 11,4 1 4

2. Edition

En

supersedes 4.82
company: Daimler-Benz
engine: OM 407

PES 6 P 110 A 820 LS 442 RSV 350-750 P 1/487

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,2-3,3}
(3,15-3,35) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
730	11,7+0,1	11,9 - 12,1	0,4(0,8)			
350	7,3-7,5	1,3 - 2,1	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	-	-	-	-	-
	x=2,5									
⑤ ca.	10,7	750-755								
	4,0	785-795								
	850	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery idle		5a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min						Control rod travel mm	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	rev/min 9	Control rod travel mm 9
730	119,0 - 121,0 (116,0 - 124,0)	750-755*	-	-	100	130,0-150,0	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

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Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 11,4 L 1
2. Edition

En

Testoil-ISO 4113

PES 6 P 110 A 820 LS 442 RQ 300/1100 PA 327-2

supersede 8.81
company Daimler-Benz
OM 407 h
engine 177 kW (241 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,2 - 3,3$ mm (from BDC) Zyl. 6
(3,15-3,35)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,3+0,1	12,5 - 12,7	0,4(0,8)			
300	7,7-7,9	1,3 - 1,9	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Test specifications rev/min 5	Control rod travel mm 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	13,0-14,0	600	13,5	10,3 4,0 1350	1145-1160 1180-1210 0 - 1,5	300	7,8	100 300	min. 9,4 7,7-7,9	-	-
								365-405 =	2,0 mm		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation At 1145 - 1160 min⁻¹

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /100 strokes 7
1100	125,0 - 127,0 (122,0 - 130,0)	-	600	110,0 - 114,0 (107,0 - 117,0)	100	130,0 - 150,0

Checking values in brackets

1.83

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Test Specifications Fuel Injection Pumps and Governors

PES 5 P 110 A 820 LS 434

RQ 300/1100 PA 327-3

1 - 3 - 5 - 4 - 2

je $72^{\circ} \pm 0,5^{\circ}$ (0,75°)

supersedes 8.81

3.37

company Daimler-Benz

OM 409

engine 141 kW (192 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

3,00-3,10
(2,95-3,15)

mm (from BDC) Zyl. 5

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,7±0,1	12,0 - 12,2	0,4(0,8)			
300	7,0-7,2	1,2 - 1,8	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Test specifications rev/min 5	Control rod travel mm 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	13,8-14,6	600	14,2	9,7 4,0	1145-1160 1175-1205	300	7,1	100 300 375-415=2,0	min. 10,0 7,0-7,2	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1145 - 1160 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /100 strokes 7
1100	120,0 - 122,0 (117,0 - 125,0)	-	600	108,0 - 114,0 (105,0 - 117,0)	100	130,0 - 150,0

Checking values in brackets

1.83

Test Specifications

Fuel Injection Pumps ②

and Governors

WPP 001/4 MB 9,5 a 4

1. Edition

En

PES5P110A820 LS 434

RQ300/1100 PA 327-4

supersedes _

company: Daimler-Benz

engine: OM 409

135 kW (184 PS)

1 - 3 - 5 - 4 - 2 je $72^\circ \pm 0,50^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,0-3,1$
 $(2,95-3,15)$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,1+0,1	11,0-11,2	0,4(0,8)			
300	8,0-8,2	1,2 - 1,8	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	13,8-14,6	600	14,2	10,1 4,0 1300	1145-1160 1175-1205 0 - 1,0	300	7,1	100 300	min. 8,7 7,0-7,2	-	-

Torque-control travel
on flyweight assembly dimension a = - mmSpeed regulation: At $1145-1160 \text{ min}^{-1}$ 1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
1100	110,0-112,0 (107,0-115,0)	-		600	94,0-98,0 (91,0-101,0)	100	130,0-150,0

Checking values in brackets

Test Specifications Fuel Injection Pumps ② and Governors

Testoil-ISO 4113

PES 6 P 110 A 820 LS 442 RQ 300/950 PA 483

supersedes 3.82

company: Daimler-Benz

engine: OM 407

162 kW (220 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,2 - 3,3$ mm (from BDC) Zyl. 6
 $(3,15 - 3,35)$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
950	12,1+0,1	12,2 - 12,4	0,4(0,8)			
300	8,0-8,2	1,4 - 2,0	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5 rev/min 6		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 10 rev/min 9		Torque control rev/min 11		Control rod travel mm 12	
600	13,0-14,0	600	13,5	11,1 4,0 1150	995-1010 1010-1045 0 - 1,0	300	8,1	100 300 410-450	min.9,7 8,0-8,2 =2,0mm	-	-	-	-

Torque-control travel on flyweight assembly dimension a = mm

 995 - 1010 min⁻¹
 Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery idle speed rev/min 6	
	cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes/mm 7
950	122,0 - 124,0 (119,0 - 127,0)	-	-	600	118,0 - 122,0 (115,0 - 125,0)	100	140,0 - 160,0

Checking values in brackets

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MB 8,7 1

2. Edition

En

Testoil-ISO 4113

PE6A90D410RS2124

RQ 450/1250 AB 812

supersedes 11.80

company Daimler-Benz

OM 360

engine: 141kW (192 PS)

1 - 5 - 3 - 6 - 2 - 4
0 - 60-120-180-240-300° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,10-2,30) mm (from BDC)
2,15-2,25

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	10,2+0,1	8,6 - 8,7	0,3(0,45)			
450	5,9-6,1	1,2-1,8	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	Setting point rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
700	15,6-16,4	700	16,0	9,2	1295-1310	450	6,0	100	min. 7,5	-	-
				4,0	1345-1375			450	5,9-6,1		
								600	0 - 1,0		
								500	540=2,0		

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation: At

1295-1310 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery idle speed ⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
1250	86,0 - 87,0 (84,0 - 89,0)	800	800	80,0 - 83,0 (78,0 - 85,0)	100	19,0-21,0 mm RW

Checking values in brackets

Test Specifications

Distributor-type Fuel-injection Pumps

WPP 001/4 VWV 2,4 c

1. Edition

En

VE 6/10 F 2400 L 116-3

0 460 406 021

supersedes

company: VWV

engine: 087 T

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	1,5 - 1,9 mm	0,75	
1.2 Supply pump pressure	1500	5,7 - 6,3 bar (kgf/cm ²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	25,5 - 26,5 cm ³ /1000 strokes	0	
Full-load delivery with charge-air pressure	1500	44,0 - 45,0 cm ³ /1000 strokes	0,75	3,0
1.4 Idle speed regulation	375	6,0 - 10,0 cm ³ /1000 strokes	0	3,0
1.5 Start	100	min. 42,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	2600	10,0 - 16,0 cm ³ /1000 strokes	0,75	
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	1200	1500	2400
LDA=0,75bar	mm	0,2-1,0(0-1,3)	(1,0-2,4)	5,4-6,2(5,1-6,5)
2.2 Supply pump	n = rev/min	600		2400
LDA=0,75bar	bar (kgf/cm ²)	3,3-3,9		8,1-8,7
Overflow delivery	n = rev/min	600		2400
	cm ³ /10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2750	max. 4,0	0,75
	2600	(9,0-17,0)	0,75
	2400	35,0-37,0 (33,7-38,3)	0,75
	1500	(42,2-46,8)	0,75
	* 800	32,5-33,5 (30,0-36,0)	0,30
	600	(23,0-29,0)	0
switch-off mech.	2400	0	
elektr.	400	0	
Idle stop	375	(4,0-12)	
	600	max. 3,0	
End stop	400	min. 20,0	
	500	max. 30,0	
2.4 Solenoid	max. cut-in voltage xxx min. 10 V rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,3-6,6
MS	1,7-1,9
SVS	2,4
XK	21,8-23,8
XL	9,4-12,7

Observations

Manifold-pressure
compensator stroke
= 4,2 mm.
Correction at the
adjusting nut (46)

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12.82

Test Specifications

Distributor-type Fuel-injection Pumps

WPP 001/4 VWV 1,6 V

2. Edition

En

VE 4/9 F 2000 R 86

0 460 494 088

superseded by 5.82

company: VWV

engine: 086-1.6 Bell

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting -- mm

see VDT-W-460/.

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,9-3,3 mm		
1.2 Supply pump pressure	1500	4,9-5,5 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	33,5-34,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle speed regulation	350	5,0-9,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Start	100	min. 38,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2100	21,0-27,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	--	--		

2. Test Specifications checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,3-2,1(1,0-2,4)	1500 (2,4-3,8)	2000 4,6-5,4(4,3-5,7)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,1-2,7		2000 6,0-6,6
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)		2000 55-138(40-153)

2.3 Fuel deliveries				3. Dimensions <small>for assembly and adjustment mm</small>	
Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)	Designation	
End stop	2200 2100 2000 1500 600	0,5-7,5 (0-8,0) (20,0-28,0) 27,0-29,0 (25,7-30,3) (31,7-36,3) 22,0-25,0 (20,5-26,5)		K KF MS SVS + FH	3,2-3,4 5,7-5,9 1,2-1,4 max. 2,5 1,8-2,4
switch-off				A XK B XL	18,4-20,4 6,1-8,4
elect.	400	0			
Idle stop	460	max. 1,5 (3,0-11,0)		Observations	
End stop	400 500	min. 18,5 max. 24,0			
2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V rated voltage 12V.				

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 Volvo 3,6 g¹

1. Edition

En

VE 6/11 F 1800 L 19-7

0 460 416 025

supersedes

company: Volvo

engine: TAMD 40 B (121 kW)

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,2 mm $\pm 0,02$ (0,04)

see VDT-W-460/

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,6-3,0 mm		
1.2 Supply pump pressure	1500	6,2-6,8 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	78,0-79,0 cm ³ /1000 strokes		3,0(3,5)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	400	8,5-12,5 cm ³ /1000 strokes		3,0(3,5)
1.5 Start	100	min. 60 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1900	43,5-49,5 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	1000	1500	1750
	mm	0,7-1,5(0,4-1,8)	(2,1-3,5)	3,6-4,4(3,3-4,7)
2.2 Supply pump	n = rev/min	400		1750
	bar (kgf/cm ²)	2,3-2,9		7,1-7,7
Overflow delivery	n = rev/min	600		1800
	cm ³ /10 s	55-138(40-153)		55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2130 2050 1900 1770 1500 600	max. 2,5 6,5-12,5(5,0-14,0) (42,0-51,0) 72,8-75,8 (71,6-77,0) (75,8-81,2) 66,5-70,5 (65,1-71,9)	
switch-off			
Idle stop	580 500 400	0 max. 2,0 (6,0-15,0)	
End stop	120 220	min. 60 max. 60	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,9-6,1
MS	1,4-1,6
SVS	max. 2,3
XK	18,7-20,7
B	
XL	10,9-14,2

Observations

2.4 Solenoid	max. cut-in voltage xxxx min. 10 V rated voltage 12V.
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Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 PEU 1,9a

1. Edition

En

VE 4/9 F 2300 R 114

0 460 494 112

supersedes

company: Peugeot

engine: XUD g

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

—

mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	2000	7,8-8,2 mm		
1.2 Supply pump pressure	2000	5,9-6,5 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1250	31,5-32,5 cm ³ /1000 strokes		2,5
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	300	25,0-29,0 cm ³ /1000 strokes		3,0
1.5 Start	100	min. 45 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2500	7,0-13,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	2000	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 2,0-3,0(1,8-3,2)	1250 3,4-4,2(3,1-4,5)	2000 (7,3-8,7)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,0-2,6	1250 3,9-4,5	
Overflow delivery	n = rev/min cm ³ /10 s	600 55-111(40-126)	2300 55-111(40-126)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2650 2500 2400 2250 2000 1250 600	max. 4,0 (6,0-14,0) 21,0-27,0 (20,0-28,0) 27,0-29,0 (25,7-30,3) 28,0-30,0 (26,7-31,3) (29,7-34,3) 27,0-30,0 (25,5-31,5)	
switch-off			
Idle stop	300 400 450-550	(23,0-31,0) max. 10,0 0	
End stop	250 500	min. 45 max. 35	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,3
KF	5,7-5,9
MS	1,3-1,5
SVS	max. 4,0
AK	18,9-20,9
B	
XL	9,6-13

Observations

2.4 Solenoid	max. cut-in voltage XXXX min. 10 V rated voltage 12V.
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11.82

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 REN 2,0 e

2. Edition

En

VE 4/9 F 2400 R 95

0 460 494 105

supersedes 6.82
company: Renault
engine: F 8 M

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting - mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1400	4,1-4,5 mm		
1.2 Supply pump pressure	1400	4,9-5,5 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1000	30,0-31,0 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	425	6,0-10,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Start	100	min. 42,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2650	10,5-16,5 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	1400	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 2,3-3,1(2,0-3,4)	1400 (3,6-5,0)	2000 6,3-7,1(6,0-7,4)	2400 7,0-7,7(6,6-8,0)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,5-3,1			2400 7,7-8,3
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)			2400 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2750 2650 2500 2400 2100 1400 1000 600	max. 6,0 (9,5-17,5) 21,0-29,0 (21,0-29,0) 26,5-29,1 (25,5-30,1) 27,5-29,9 (26,4-31,0) 30,6-32,6 (29,3-33,9) (28,2-32,8) 24,3-27,3 (22,8-28,8)	
switch-off	2400	0	
Idle stop	650 600 425	0 0,2-5,2 (4,0-12,0)	
End stop	330 500	min. 30,0 max. 29,0	

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	2,8
AK	18,7-20,7
XL	9,5-12,8

Observations

2.4 Solenoid max. cut-in voltage xxx min. 10,0 V
rated voltage 12V.

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12.82

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 S0F 2,5c
2. Edition

En

supersedes 4.82
company Sofim
engine RJV-LKW

Testoil-ISO 4113

VE 4/9 F 1950 R 22-4
0 460 494 070

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm \pm 0,02 (0,04) mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1800	7,4-7,8 mm		
1.2 Supply pump pressure	1800	6,2-6,8 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1950	33,5-34,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle speed regulation	350	6,0-10,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Start	100	min. 55,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2150	14,0-20,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery		--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	400 1,9-2,7(1,6-3,0)	1100 4,9-5,5(4,5-5,9)	1800 (6,9-8,3)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,9-3,5	1100 4,6-5,2	
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)	1950 55-111(40-126)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2250 2150 1950 1100 600	max. 10,0 (13,0-21,0) (31,7-36,3) 37,7-40,3 (36,7-41,3) 30,0-33,0 (28,5-34,5)	
switch-off	1950	0	
Idle stop	500 350	max. 5,0 (4,0-12,0)	
End stop	350 480	min. 32 max. 34	
2.4 Solenoid	max. cut-in voltage test voltage	min. 10 V rated voltage 12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	--
KF	5,4-5,6
MS	1,7-1,9
SVS	max. 2,7
* FH	1,8-2,4
A	
B	

Observations

*operating
stroke (KSB)

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1.83

D22

D22

Test Specifications

Distributor-type Fuel-injection Pumps

WPP 001/4 VWV 1,6v1

3. Edition

En

VE 4/9 F 2000 R 85

0 460 494 086

supersedes 6.82

company: VWV

engine: Industrie-Motor 065.5

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,9-3,3 mm		
1.2 Supply pump pressure	1500	4,9-5,5 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	32,5-33,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle speed regulation	425	6,0-10,0 cm ³ /1000 strokes		2,0(3,0)
1.5 Start	100	min. 38,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2050	9,0-15,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	--	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,3-2,1(1,0-2,4)	1500 (2,4-3,8)	2000 4,6-5,4(4,3-5,7)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,8-3,4		2000 6,1-6,7
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)		2000 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2070	max. 2,0	
	2050	(8,0-16,0)	
	2000	29,0-31,0 (27,7-32,3)	
	1500	(30,7-35,3)	
	600	21,0-24,0 (19,5-25,5)	
mech. switch-off	2000	0	
elektr.	400	0	
Idle stop	600	max. 2,0	
	425	(4,0-12,0)	
End stop	400	min. 17,5	
	500	max. 23,0	
2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
svs	max. 2,5
+ FH	1,8-2,4
XK	18,4-20,4
XLB	13,6-17,0

Observations

+ *operating
stroke (KSB)

Test Specifications

Distributor-type

Fuel-injection Pumps

WVP 001/4 VWV 1,6v4

3. Edition

En

VE 4/9 F 1800 R 85-1

0 460 494 107

supersedes 6.82

company: VWV

engine: 638/10

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/.

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,9-3,3 mm		
1.2 Supply pump pressure	1500	4,9-5,5 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	32,5-33,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery with charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle speed regulation	425	6,0-10,0 cm ³ /1000 strokes		2,0(3,0)
1.5 Start	100	min. 38,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1870	9,0-15,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	--	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,3-2,1(1,0-2,1)	1500 (2,4-3,8)	1780 3,7-4,5(3,4-4,8)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,8-3,4		1780 5,5-6,1
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)		1800 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1950	max. 2,0	
	1870	(8,0-16,0)	
	1780	29,9-31,9 (28,6-33,2)	
	1500	(30,7-35,3)	
	600	21,0-24,0 (19,5-25,5)	
switch-off elect.	400	0	
Idle stop	600	max. 2,0	
	425	(4,0-12,0)	
End stop	400	min. 17,5	
	500	max. 23,0	
2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V test voltage xxx rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-5,9
MS	1,2-1,4
SVS	max. 2,5
+ FH	1,8-2,4
XK _A	18,4-20,4
XL _B	9,7-13,1

Observations

+ *operating
stroke (KSB)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 12,0 f1
2. Edition

En

PE 6 P 120 A 320 RS 3071 RQV 250-1025 PA 371
Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

supersedes 2.81
company: Volvo
engine: TD 120 GA

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,6-2,7}{(2,55-2,75)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,4+0,1	20,5-20,8	0,5(0,9)			
250	5,6-5,7	2,2-2,6	0,5(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca. 12	100	min. 7,1	250	1,1-1,2
ca. 40	10,4	1065-1075					250	5,6-5,7	500	2,9-3,3
	4,0	1145-1175							800	5,1-5,4
	1300	0 - 1,0							1025	7,2

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥	Torque-control ⑤ travel Control rod travel mm		
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
LDA 700	0,9 bar 205,0-208,0 (202,0-211,0)	1065-1075*	LDA 700	0 bar 157,0-161,0 (154,0-164,0)	100	230,0-270,0 =RW 20,0- 21,0 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P..RS 3071 +RQV.. PA 371	0,57	0,90 0 0,33	11,0-11,1 11,4-11,5 9,0-9,1 9,9-10,1

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

2

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 12,0 f 3

1. Edition

En

PE 6 P 120 A 320 RS 3071 Y RQV 250-1025 PA 371

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

supersedes¹⁾

company: Volvo

engine: TD 120 G
213 kW (290 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,6-2,7}{(2,55-2,75)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,2+0,1	17,5-17,8	0,6(0,9)			
250	5,7-5,9	2,2-2,6	0,3(0,6)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca.12	100	min.7,2	200	0,7-0,9
ca. 42	9,2 4,0 1300	1065-1075 1145-1175 0-1,0					250	5,7-5,9	475	2,7-3,0
							340-390=2,0		750	4,7-5,0
									1025	6,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control travel	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
LDA 700	0,75 bar 175,0-178,0 (172,0-181,0)	1065-1075*	LDA 700	0 bar 155,0-159,0 (152,0-162,0)	100	240,0-280,0 =RW 20,0- 21,0 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

-2-
VOL 12,0 f 3

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P..RS 3071 Y +RQV..PA 371	0,29	0,75 0 0,24	9,9-10,0 10,2-10,3 9,2-9,3 9,5-9,7

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications

Fuel Injection Pumps ② and Governors

WPP 001/4 DAF 11,6 i 8

2. Edition

En

PE 6 P 110 A 320 RS 372-1
Komb.-Nr. 0 401 846 463

RQ 250/1100 PA 417-1
RQ 250/1100 PA 417

superseded 1.82

company: DAF

engine: DKTD 1160
191 kW (260 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

^{2,8-2,9}
(2,75-2,95)

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
850	11,9+0,1	13,5-13,7	0,4(0,8)			
250	6,6-6,8	0,7-1,1	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
700	15, -16,4	700	16,0	11,0 4,0 1350	1145-1160 1220-1250 0 - 1,0	250	6,7	100 250 460-500 = 2,0	min.7,8 6,6-6,8 = 2,0	850 1100	12,0-12,1 11,9-12,1

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At 1145-1160 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a	③b		⑥	
rev/min	cm ³ /-1000 strokes	rev/min	rev/min	cm ³ /-1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3	4	5	6	7
LDA 850	0,7 bar 134,5-136,5 (132,0-139,0)	-	LDA 600	0 bar 125,0-128,0 (122,0-131,0)	100	245,0-285,0 = 19,5-21,0 mm RW

Checking values in brackets

3.83

D. Adjustment Test for Manifold Pressure Compensator

DAF 11,6 i 8 - 2 -

Test at n = 600 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE6P..RS372-1 + ..PA417-1 or .PA 417	0,30	0,70 0 0,26	11,8 - 11,9 11,9 - 12,0 11,3 - 11,4 11,5 - 11,7

Notes.

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4 IHC 13,4 **40**

1. Edition

En

PES 6 P 110 A 420 LS 3043

RSV 350-1100 P0/431 DR

supersedes

IHC
company

DTI 817 C

engine

309 kW (420 PS)

Komb.-Nr. 0 402 076 712

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,0-2,1}{(1,95-2,15)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	15,4+0,1	25,8-26,0	0,8			
300	5,6-5,8	0,7-1,2	0,4			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 20	350	5,5	1080	0
ca. 44 2a	1100	15,6-16,2					100	20,0-21,0	750	0,9-1,1
	1200	6,0-9,2					350	5,4-5,6	500	0,9-1,1
	1280	1,3-2,0					410	1,3-2,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note: changed to)							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1100	1,2 bar 257,5-259,5 (254,5-262,5)			LDA 700	1,2 bar 284,5-288,5 (281,5-291,5)	100	255,0-295,0		
				LDA	0 bar 151,5-155,5 (148,5-158,5)				

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

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E7

E7

D. Adjustment Test for Manifold Pressure Compensator

IHC 13,4 d - 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PES 6 P.. LS 3043 + RSV..PO/431 DR	0,09-0,17	0,80-0,93	Start End

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 MB 21,9 b 1
1. Edition

En

PE 12 P 120 A 320 LS 3819-2 RQV 350-1050 PA 493

1-5 -9 - 8 - 3 - 4 -11-10 - 2 - 6 - 7 - 12

0-15-60-75-120-135-180-195-240-255-300-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

and engine fuel-injection tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

supersedes

Daimler-Benz

company OM 424 A

engine: 357 kW (485 PS)

Komb.-Nr.

0 401 840 711

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke

4,0 - 4,1

(3,95-4,15)

mm (from BDC) Zv1, 12

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1050	10,2+0,1	15,1-15,3	0,5(0,8)			
350	4,6-4,8	1,2- 1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1150	15,2-17,8	-	-	-	ca. 10	100	min. 6,2	300	0,9-1,1
							350	4,6-4,8	550	3,4-3,6
ca. 56	9,2	1080-1090							800	4,7-4,9
	4,0	1175-1205							1050	6,8
	1350	0 - 1,0				360-500				
						③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed	Fuel delivery characteristics		Starting fuel delivery		Torque-control	
②		②b	⑤a		⑥		⑤	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1050	0,6 bar 151,0-153,0 (148,0-156,0)	1080-1090*	LDA 1050 **	0,6 bar 120,0-123,0 (117,0-126,0)	100	130,0-150,0	-	-
			LDA 500	0 bar 124,0-126,0 (121,0-129,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Set at the reduced-delivery stop.

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D. Adjustment Test for Manifold Pressure Compensator

MB 21,9 b 1 - 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 12 P..LS3819-2 +ROV..PA 493	0,28	0,60 0 0,24	9,9-10,0 10,2-10,3 9,4-9,5 9,6-9,8

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 KHD 1 g 3
3. Edition

En

PES 4 A 85 D 410/3 RS 2638

RSV 325-1150 A 8 B 2168

Komb.-Nr. 0 400 864 054

superseded 1.82

company: KHD

engine: BF 4 L 913 T
66 kW (90 PS)₁
2300 min⁻¹

Tractor DX 92 (1)

60 kW (82 PS)₁
2300 min⁻¹

Tractor DX 86 (2)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\begin{matrix} 2,5-2,6 \\ (2,45-2,65) \end{matrix}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery (1) cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery (2) cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,8+0,1	8,2 - 8,3	0,3(0,45)	10,6+0,1	7,5-7,6	
325	7,7-7,9	1,0 - 1,6	0,2(0,4)	7,7-7,9	1,0-1,6	

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 26	325	7,3	1150	11,8+0,1
	X = 4,0						100	min. 19,0	500	11,3+0,1
							325	7,7-7,9	965	12,0+0,2
ca. 54	10,8	1190-1200					720-780	= 2,0		
⑤	4,0	1325-1355								
	1495	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
1150	82,0-83,0 (80,0-85,0)	1190-1200*	800	74,5-77,5 (72,5-79,5)	100	108,5-118,5 = RW 17,3 - 17,9 mm	-	-	

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

Testoil-ISO 4113

BOSCH

Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
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E11

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca.26	325	7,0	1150	10,5+0,1
	x = 4,0						100	min.19,0	500	11,2+0,1
ca.56	9,6	1220-1230					325	7,4-7,6	900	10,9+0,3
	4,0	1325-1355					720-780 = 2,0			
	1475	0,3-1,7								
2a										

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limitat.		3a Fuel delivery characteristics		5 Starting fuel delivery Idle		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
(2) 1150	74,5-75,5 (72,5-77,5)	1220-1230*	800		65,5-68,5 (63,5-70,5)	100	108,5-118,5	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113**B. Governor Settings**

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
2a										

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limitat.		3a Fuel delivery characteristics		5 Starting fuel delivery Idle		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 6,1 a 1

3. Edition

En

PES 6 A 85 D 410/3 RS 2415

RS 325/1325 AOB 691 DL
709 DL

superseded by 1.82

company: KHD

engine: BF6 L 913
110 kW (150 PS)
2650 min⁻¹Test RS governor according to WPP 001/4
KHD 1 c.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{1,9-2,0}{(1,85-2,05)}$ mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1325	12,0+0,1	8,7 - 8,8	0,3(0,45)			
325	8,2-8,4	1,4 - 2,0	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-		325	6,5	1325	12,0+0,1
	X =	7,0							500	12,5+0,2
5a.68	11,0	1355-1365					100	min.16,0	1060	12,1+0,2
⑤	4,0	1450-1480					325	6,4-6,6		
	1600	0,3-1,7					500	3,4-4,0		
							1330-1370	=2,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limitat.		3a Fuel delivery characteristics		Starting fuel delivery idle		5a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min							
rev/min	cm ³ /1000 strokes	3		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2			4	5	6	7	8	9
LDA 1325	0,7 bar 86,5-87,5 (84,5-89,5)	1355-1365*		LDA 500	0 bar 56,0-58,0 (53,5-60,5)	100	15,0-16,0 mm RW	-	-
				LDA 800	0,7 bar 76,5-78,5 (74,0-81,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

D. Adjustment Test for Manifold Pressure Compensator

KHD 6,1 a 1 - 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PES 6 A..RS 2415 + ..AOB 691 DL + ..AOB 709 DL	0,27	0,70 0,37 0	11,6 - 11,8 12,5 - 12,7 12,2 - 12,3 11,3 - 11,5

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 4,7 c

2. Edition

En

PES 5 A 80 D 410/3 RS 2603 RS 325/1650 A O B 2087 L

supersedes 10.82

company: KHD

 engine: F 5 L 912
 63 kW (85 PS)₁
 3000 min⁻¹

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

 Port closing at prestroke $\frac{1,9 - 2,0}{(1,85-2,05)}$ mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1500	9,9-10,0	5,1 - 5,2	0,2(0,35)			
325	8,7-8,9	1,7 - 2,1	0,2(0,3)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	VH max	325	8,8	-	-
						FHca.18	100	min.13,6		
							325	8,7-8,9		
VH ca.49	8,9	1690-1700					550-590	=2,0		
⑤ max.	4,0	1740-1770					600	max.1,8		
	1900	0 - 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min							
rev/min	cm ³ /1000 strokes			rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1500	50,5-51,5 (49,0-53,0)	1690-1700*		-	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

Test Specifications Fuel Injection Pumps ② and Governors

WzP 001/4 MB 18,3 e

2. Edition

En

PE 10 P 120 A 320 LS 3824 RQ 300/1050 PA 656
 1- 8- 7- 6 - 3 - 5 - 2 - 10 - 9 - 4
 0-27-72-99 -144-171-216-243 -288-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)
 Values apply to
 engine nozzle-and-holder assemblies 1 688 901 019
 and engine fuel-injection tubing 1 680 750 067

supersedes 10.82
 company: Daimler-Benz
 OM 423 LA
 engine: 346 kW (470 PS)
 Euclid
 Komb.-Nr.
 0 401 849 707

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers.

A. Fuel Injection Pump Settings

Port closing at prestroke $4,0 - 4,1$
 (3,95-4,15) mm (from BDC) ± 10

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1050	11,3+0,1	17,7-17,9	0,5 (0,8)			
300	5,0-5,2	1,6-2,2	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
600	19,2-20,8	600	20,0	10,3	1095-1110	300	4,3	100	min. 5,8	-	-
VH =	max. 46°			4,0	1165-1195			300	4,2 - 4,4		
				1300	0-1,0			335-375	= 2,0		

Torque-control travel
on flywheel assembly dimension a = 0 mm

Speed regulation: At

1095-1110 min⁻¹
1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min	cm ³ /-1000 strokes	rev/min		rev/min	cm ³ /-1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3		4	5	6	7
LDA	0,9 bar	-		LDA	0,9 bar	100	150,0-170,0
1050	177,0-179,0 (174,0-182,0)			600	173,0-179,0 (170,0-182,0)		
				LDA	0 bar		
				500	141,0-143,0 (138,0-146,0)		

Checking values in brackets

3.83

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

MB 18,3 e

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 10 P..LS 3824 + RQ..PA 656	0,90		11,3 - 11,4
		0	10,2 - 10,4
		0,41	10,9 - 11,1
		0,35	10,5 - 10,6

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications

Fuel Injection Pumps ②

and Governors

WPP 001/4 MB 11,4 i

4. Edition

En

Testoil-ISO 4113

PES 6 P 120 A 820 LS 3077 RQ 300/1100 PA 585
 Values apply to
 engine nozzle-and-holder assemblies 1 688 901 019
 and engine fuel-injection tubing 1 680 750 067

superseded 1.81

company: Daimler-Benz

engine: OM 407 LA

235 kW (320 PS)

Komb.-Nr. 0 402 046 722

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

4,0-4,1
(3,95-4,15)

mm (from BDZ) 1. 6

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1100	13,4+0,1	21,2 - 21,4	0,5 (0,9)			
300	5,5-5,7	1,4 - 2,0	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
650	19,2-20,8	650	20,0	12,4	1145-1160 4,0 1200-1230	300	4,9	100 300 370-410=2,0 mm	min.6,5 4,8-5,0	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1145-1160 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
②		③a		③b		⑥	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3	4	5	6	7	
LDA 1100	0,70 bar 212,0 - 214,0 (209,0 - 217,0)	-		LDA 600 0 bar 500	0,70 bar 205,0 - 211,0 (202,0 - 214,0) 146,0 - 148,0 (143,0 - 151,0)	100	170,0 - 190,0

Checking values in brackets

3.83

D. Adjustment Test for Manifold Pressure Compensator

MB 11,4 i -2-

Test at n = 500 ^{rev/min} decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P .. LS 3077 + .. PA 585	0,70	0 0,42 0,31	13,4-13,5 10,7-10,8 12,6-12,7 11,4-11,5

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ② and Governors

En

PES 6 P 110 A 720 LS 360

RQ 250/1100 PA 335 DR (1)

supersedes 1.79

company: M A N

RQV 250-1050 PA 373 DR (2)

D 2566 MTUH

engine:

(1 - 206 kW - 280 PS Nr. 7059)

(2 - 202 kW - 275 PS Nr. 7999)

6 - 2 - 4 - 1 - 5 - 3 $\pm 0,50$
 0 -60 -120-180-240-300⁰ ($\pm 0,75$)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,00-3,10$ mm (from BDC) RW 9,0 - 12,0 mm; Zyl. 6
 (2,95-3,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	12,1+0,1	14,6 - 14,8	0,4(0,8)	12,0+0,1	14,9 - 15,1	n = 1050
250	6,8-7,0	1,1 - 1,7	0,4(0,7)	6,8-7,0	1,1 - 1,7	
700/500	- - -	C	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQ.. 335 DR (1)

Checking of slider PRG check ①		Full-load speed regulation Setting point ①				Idle speed regulation Setting point ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	19,2-20,8	600	20,0	11,1	1145-1160	250	6,9	100	min. 8,5	1100	12,1-12,2
				4,0	1200-1230			250	6,8-7,0	1000	12,3-12,5
VH = max. 46°				1350	0 - 1,0			370-410	=2,0	800	12,6-12,8
										700	12,8-12,9

Torque-control travel
on flyweight assembly dimension a = 0,3 mm

Speed regulation: At 1145-1160 min⁻¹ 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	Change-over point rev/min 6
(1) 1100	LDA 0,7 bar 146,0-148,0 (143,5-150,5)		LDA 500	0,2 bar 123,0 - 127,0 (120,0 - 130,0)	100
700	157,0-161,0 (154,0-164,0)		LDA 500	0 bar 111,0 - 113,0 (108,0 - 116,0)	100-170 (80-190)

Checking values in brackets

B. Governor Settings

RQV... 373 DR (2) MAN 11,1 1 4

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1050	15,2-17,8	-	-	-	ca. 16	100 250 520-	min. 8,5 6,8-7,0 580 = 2,0	250 800 1150	0,9-1,1 5,3-5,5 8,3
ca. 66	11,1 4,0 1400	1090-1100 1205-1235 0 - 1,0				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	rev/min
1	2	3	4	6	8
(2) 1050	LDA 0,7 bar 148,5-150,5 (146,0-153,0)	1090-1100*	LDA 500 0,2 bar 123,0-127,0 (120,0-130,0)	100 215,0-2 5,0	1100 12,0+0,1
700	153,0-157,0 (150,0-160,0)		LDA 500 0 bar 111,0-113,0 (108,0-116,0)	100-170 (80-190)	850 12,2+0,2
					700 12,6+0,1

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel difference
	Gauge pressure = bar	Gauge pressure = bar	mm
360 + 335 DR	0,70	0,32 0,20 0	12,8 - 12,9 12,2 - 12,4 11,5 - 11,6 10,9 - 11,0
360 + 373 DR	0,70	0,32 0,20 0	12,6 - 12,7 12,2 - 12,4 11,4 - 11,5 10,9 - 11,0

En

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 DAF 8,3 k 2

1. Edition

En

PE 6 A 95 D 410 RS 2525 RQ 225/1200 AB 1156 L
Specifications apply to test tubing 1 680 750 015

supersedes
company: DAF
engine: DH 825

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{2,0-2,1}
(1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	10,4+0,1	7,3-7,5	0,35(0,6)			
225	5,7-5,9	0,6-1,0	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point ①				Idle speed regulation Setting point ①				Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
650 VH=	19,2-20,8 max. 46°	650	20,0	9,4 4,0 1400	1245-1260 1300-1330 0-1,0	225	6,1	100 225 345-385 450	min. 7,5 6,0-6,2 =2,0 max. 1,0	1200 650 1035 1100	10,4-10,5 11,1-11,2 10,7-10,9 10,5-10,8

Torque-control travel 0,25 mm Speed regulation: At 1245-1260 min⁻¹ 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery idle speed ⑥	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	cm ³ /1000 strokes / mm 7
1200	73,0-75,0 (71,0-77,0)		800	74,5-77,5 (72,0-80,0)	100	121,5-131,5 = 19,5-21,0 mm RW

Checking values in brackets

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 6,1 K 2

2. Edition

En

PES 6 A 85 D 410 RS 2592

RQV 300-1250 AB 1158 L

Komb.-Nr. 0 400 846 497

supersedes 9.82

company: KHD

engine: BF 6 L 913

GMC vehicle
118 kW (160 PS)
/ 2500 min⁻¹

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke ^{2,2-2,3}
(2,15-2,35) mm (from BDC) 9,0-12,0 mm RW

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	12,5+0,1	8,4-8,5	0,3 (0,45)			
300	8,3-8,5	1,0-1,6	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1290	15,2-17,8	-	-	-	ca.17	100	min.10,2	250	0,5-0,8
ca. 66	11,5	1290-1300					300	3,3-8,5	580	3,6-3,7
	4,0	1375-1405							920	5,3-5,4
	1500	0 - 1,0				450-575			1250	8,1
						③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA	0,7 bar	1290-1300*	LDA	0,7 bar	100	102,0-112,0	1250	12,5+0,1
			800	80,5-82,5		19,0-	500	13,2+0,1
				(78,0-85,0)		21,0 mm RW	800	13,2+0,1
1250	83,5-84,5		LDA	0 bar			1000	12,9+0,2
	(81,5-86,5)		500	59,0-61,0			1100	12,7+0,3
				(56,5-63,5)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

D. Adjustment Test for Manifold Pressure Compensator

KHD 6,1 k 2 - 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PES 6 A..RS 2592 + RQV..AB 1158 L	0,70	0 0,48 0,33	13,2 - 13,3 11,8 - 11,9 12,8 - 12,9 11,9 - 12,1

Notes.

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Distributor-Type Fuel Injection Pump

46

WPP 001/4 STE 4,0a 3

2. Edition
En

VA 4/90 H 1200 CR 164
0 460 394 010

superseded 6.82
company Steyr
engine WD 408.40

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for
Bosch Fuel Injection Pump Test Benches
and Testers
Test Instructions and Test Equipment
VDT-WPP 161/4 B
Pre-setting see reverse side

Pre-stroke setting 0,3 mm \pm 0,02 (\pm 0,04)

Testoil-ISO 4113

1. Settings	rev/min	Settings	Charge-air press kp/cm ²	Difference in delivery cm ³
1.1 Timing device travel	900	2,2-3,0 mm		
1.2 Supply pump pressure	900	4,8-5,3 kp/cm ²		
1.3 Full-load delivery without charge-air pressure	1200	62,0-63,0 cm ³ /1000 strokes		2,5
Full-load delivery with charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle speed regulation	300	10,0-16,0 cm ³ /1000 strokes		3,0
1.5 Start (autom.)	100	mind. 75,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1280	31,0-39,0 cm ³ /1000 strokes		

2. Test Specifications

Checking values in brackets

2.1 Timing device	rev/min	590-700 (560-730)	900	920-1050
	mm	Start	(1,9-3,3)	2,9-3,6 (2,6-3,9)
2.2 Supply pump	rev/min	200	900	1200
	kp/cm ²	1,5-2,0 (1,3-2,2)	(4,6-5,5)	5,6-6,1 (5,4-6,3)
Overflow delivery	rev/min	500		1200
	cm ³ /10 s	55-100 (40-110)		55-100 (40-110)

2.3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm ³ /1000 strokes	Charge-air pressure kp/cm ²
End stop	Full	1330-1400 (1310-1420)	0	
		1280	(30,0-40,0)	
		1200	(61,5-63,5)	
		900	60,0-62,0 (59,0-63,0)	
		500	56,0-60,0 (55,0-61,0)	
	Stop	1200	0	
Idle stop	Full	400-470 (380-490)	0	
		300	(9,0-17,0)	
	Start	100	mind. 75,0	
End stop				

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Angle to the stop-plate	Pre-setting dimensions
Pump $\alpha = 25 \pm 4^\circ$ $\beta = 45 \pm 8^\circ$ $\gamma = 30 \pm 8^\circ$ $\delta = 60 \pm 8^\circ$	Pump Dimension IV = 3,5 mm Dimension V = 24,6 mm

Test Specifications Distributor-Type Fuel Injection Pump

46

WPP 001/4 IHC 5, 8 q 5

2. Edition

En

VA 3/10 H 1200 CR 409
CR 409 P

0 460 303 156

supersedes IHC
company D 159/53 HP
engine

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for
Bosch Fuel Injection Pump Test Benches
and Testers
Test Instructions and Test Equipment
VDT-WPP 161/4 B
Pre-setting see reverse side

Testoil-ISO 4113

Pre-stroke setting $0,3^{mm}$
Setting of the pointer at a stroke of 1 mm in
relation to outlet "A".

1. Settings	rev/min	Settings	Charge-air press kp/cm ²	Difference in delivery cm ³
1 1 Timing device travel	1000	4,8-5,8 mm		
1 2 Supply pump pressure	1000	5,6-6,1 kp/cm ²		
1 3 Full-load delivery without charge-air pressure	800	72,5-73,5 cm ³ /1000 strokes		2,5
Full-load delivery with charge-air pressure	--	-- cm ³ /1000 strokes		
1 4 Idle speed regulation	375	12,0-18,0 cm ³ /1000 strokes		3,0
1 5 Start	100	mind. 90,0 cm ³ /1000 strokes		
1 6 Full-load speed regulation	1300	26,0-34,0 cm ³ /1000 strokes		

2. Test Specifications

Checking values in brackets

2 1 Timing device	rev/min	Start	1,0-2,0 (0,7-2,3)	1000 (4,5-6,1)	1200 (6,1-6,8 (5,8-7,1))
	mm				
		200		1000	1200
2 2 Supply pump	rev/min	1,7-2,2 (1,5-2,4)	(5,4-6,3)	6,3-6,8 (6,1-7,0)	
	kp/cm ²				
Overflow delivery	rev/min	500		1200	
	cm ³ /10 s	55-100 (40-110)		55-100 (40-110)	

2.3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm ³ /1000 strokes	Charge-air pressure kp/cm ²
End stop	Full	1340-1400 (1320-1420) 1300 1180 800 500	0 (25,0-35,0) 76,5-79,5 (75,5-80,5) (72,0-74,0) 70,0-74,0 (69,0-75,0)	
	Stop	1200	0	
Idle stop	Full	420-470 (400-490) 375	0 (11,0-19,0)	
	Start	100	mind. 90,0	

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2.83

Angle to the stop-plate		Pre-setting dimensions	
Pump		Pump	
α	$25 \pm 4^\circ$	Dimension IV	- mm
β	$50 \pm 8^\circ$	Dimension V	24,65 mm
γ	$30 - 8^\circ$		
δ	$60 + 8^\circ$		

Test Specifications Distributor-Type Fuel Injection Pump

46

WPP 001/4 IHC 5,8 q 4
2. Edition

VA 6/10 H 1200 CR 408
CR 408 P
0 460 306 250

supersedes 8.81
company IHC
engine D 358

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

Pre-stroke setting 0,3 mm
Setting of the pointer at a stroke of 1 mm in
relation to outlet "A".

All test specifications are valid for
Bosch Fuel Injection Pump Test Benches
and Testers
Test Instructions and Test Equipment
VDT-WPP 161/4 B
Pre-setting see reverse side

Testoil-ISO 4113

1. Settings	rev/min	Settings	Charge-air press kp/cm ²	Difference in delivery cm ³
1.1 Timing device travel	1000	4,1-4,9 mm mm		
1.2 Supply pump pressure	1000	5,7-6,2 kp/cm ²		
1.3 Full-load delivery without charge-air pressure	800	66,5-67,5 cm ³ /1000 strokes		2,5
Full-load delivery with charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle speed regulation	350	12,0-18,0 cm ³ /1000 strokes		3,0
1.5 Start	100	mind. 90,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1280	28,0-36,0 cm ³ /1000 strokes		

2. Test Specifications

Checking values in brackets

2.1 Timing device	rev/min mm	600 1,3-2,3 (1,1-2,5)	1000 (3,8-5,2)	1200 5,2-5,9 (4,9-6,2)
2.2 Supply pump	rev/min kp/cm ²	200 1,7-2,2 (1,4-2,5)	1000 (5,5-6,4)	1200 6,4-6,9 (6,2-7,1)
Overflow delivery	rev/min cm ³ /10 s	500 55-100 (40-110)		1200 55-100 (40-110)

2.3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm ³ /1000 strokes	Charge-air pressure kp/cm ²
End stop	Full	1320-1380 (1300-1400)	0	
		1280	(27,0-37,0)	
		1150	68,0-71,0 (67,0-72,0)	
		800	(66,0-68,0)	
		500	59,5-63,5 (58,5-64,5)	
	Stop	1200	0	
Idle stop	Full	500-550 (480-570)	0	
		350	(11,0-19,0)	
	Start	100	mind. 90,0	

Angle to the stop-plate		Pre-setting dimensions	
Pump		Pump	
α	$25 \pm 4^\circ$	Dimension IV =	- mm
β	$51 \pm 8^\circ$	Dimension V =	24,65 mm
γ	$30 \pm 8^\circ$		
δ	$60 \pm 8^\circ$		

Test Specifications Distributor-Type Fuel Injection Pump

46

WPP 001/4 IHC 5,8 q 8

1. Edition

En

VA 6/10 H 1150 CR 87-3

0 460 306 260

supersedes
IHC
company
D 358
engine

Nozzle-and-holder assembly
1 688 901 020 (172 + 3 bar)

All test specifications are valid for
Bosch Fuel Injection Pump Test Benches
and Testers
Test Instructions and Test Equipment
VDT-WPP 161/4 B
Pre-setting see reverse side

Testoil-ISO 4113

Pre-stroke setting 0.4 mm
Setting of the pointer at a stroke of 1 mm in
relation to outlet "A".

1. Settings	rev/min	Settings	Charge-air press kp/cm ²	Difference in delivery cm ³
1.1 Timing device travel	700	2,4-3,2 mm		
1.2 Supply pump pressure	700	4,9-5,4 kp/cm ²		
1.3 Full-load delivery without charge-air pressure	700	69,5-70,5 cm ³ /1000 strokes		3,0
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	400	16,0-22,0 cm ³ /1000 strokes		3,0
1.5 Start	100	min. 70,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1200	36,0-44,0 cm ³ /1000 strokes		

2. Test Specifications

Checking values in brackets

2.1 Timing device	rev/min mm	500 0,6-1,6(0,4-1,8)	700 (2,1-3,5)	1150 5,2-5,9(4,8-6,2)
2.2 Supply pump	rev/min kp/cm ²	200 2,1-2,6(1,9-2,8)	700 (4,7-5,6)	1150 6,6-7,1(6,4-7,3)
Overflow delivery	rev/min cm ³ /10 s			

2.3 Fuel deliveries

Speed control lever	Delivery lever	rev/min	cm ³ /1000 strokes	Charge-air pressure kp/cm ²
End stop	Full	1250-1300	0	
		1200	(34,0-46,0)	
		1150	70,0-73,0 (69,0-74,0)	
		700	(69,0-71,0)	
		500	66,0-70,0 (65,0-71,0)	
	Stop	1150	0	
Idle stop	Full	530-580	0	
		400	(14,0-24,0)	
	Start	100	min. 70,0	

Angle to the stop-plate	Pre-setting dimensions
Pump $\alpha = 25 \pm 4^\circ$ $\beta = 42 \pm 8^\circ$ $\gamma = 30 - 8^\circ$ $\delta = 60 + 8^\circ$	Pump Dimension IV = 3,8 Dimension V = 24,65 mm

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 VWV 2,0 b 1

3. Edition

En

VE 5/10 F 2400 L 45 (P)

0 460 405 005; 006

supersedes 6.82

company: VW/Volvo

engine: 069.3

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,14 mm \pm 0,02 (0,04)

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1400	2,4-2,8 mm		
1.2 Supply pump pressure	1400	5,0-5,6 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1400	33,5-34,5 cm ³ /1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	375	6,0-8,0 cm ³ /1000 strokes		2,5 (3,0)
1.5 Start	100	min. 53,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2500	21,0-27,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,3-2,1 (1,0-2,4)	1400 (1,9-3,3)	2400 5,1-5,9 (4,8-6,2)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	500 2,8-3,4		2400 7,4-8,1
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138 (40-153)		2400 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2650 2500 2400 1400 750	max. 13,0 (20,0-28,0) 27,5-29,5 (26,2-30,8) (31,7-36,3) 23,0-26,0 (21,5-27,5)	
switch-off elect.	400	0	
Idle stop	500 375	max. 3,0 (4,0-12,0)	
End stop	400 500	min. 14,5 max. 21,5	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,7-5,9
MS	1,7-1,9
SVS	max. 3,0
A XK	18,5-20,5
XL	9,0-12,5

Observations

2.4 Solenoid max. cut-in voltage xxx min. 10,0 V
xxxxxxx rated voltage 12V.
test voltage

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Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 VWV 2,0 b

3. Edition

En

VE 5/10 F 2400 L 45-1 (P)

0 460 405 007;

008

 superseded 6.82
 company: VW/Volvo
 engine: 069.3

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

Pre-stroke setting 0,14 mm \pm 0,02 (0,04)

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1400	2,4-2,8 mm		
1.2 Supply pump pressure	1400	5,0-5,6 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1400	33,5-34,5 cm ³ /1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	375	6,0-10,0 cm ³ /1000 strokes		2,5 (3,0)
1.5 Start	100	min. 53,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2500	21,0-27,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,3-2,1 (1,0-2,4)	1400 (1,9-3,3)	2400 5,1-5,9 (4,8-6,2)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	500 2,8-3,4		2400 7,4-8,1
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138 (40-153)		2400 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2650 2500 2400 1400 750	max. 13,0 (20,0-28,0) 27,5-29,5 (26,2-30,8) (31,7-36,3) 23,0-26,0 (21,5-27,5)	
switch off MECH.	2400	0	
elektr.	400	0	
Idle stop	500 375	max. 3,0 (4,0-12,0)	
End stop	400 500	min. 14,5 max. 21,5	
2.4 Solenoid	max. cut-in voltage xxx min. 10,0 V xxxxxxxxxx rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	--
KF	5,7-5,9
MS	1,7-1,9
SVS	max. 3,0
A XK	18,5-20,5
B XL	9,0-12,5

Observations

Test Specifications Distributor-type Fuel-injection Pumps

NPP 001/4 VWV 1,6 L4

1. Edition

En

VE 4/9 F 2400 R 66-9
0 460 494 117

supersedes -
company: VWV
engine: 086

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/.

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,9-3,3 mm		
1.2 Supply pump pressure	1500	4,9-5,5 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	31,5-32,5 cm ³ /1000 strokes		3,0
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		3,0
1.4 Idle speed regulation	475	6,0-10,0 cm ³ /1000 strokes		
1.5 Start	100	min. 38,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2600	11,0-17,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1,3-2,1 (1,0-2,4)	1000 (2,4-3,8)	2400 (5,8-7,2)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	2,8-3,4	600	2400 7,0-7,6
Overflow delivery	n = rev/min cm ³ /10 s	55-138 (40-153)	600	2400 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2800 2600 2400 1500 600	max. 2,5 (10,0-18,0) 26,5-28,5 (25,2-29,8) (29,7-34,3) 19,5-22,5 (18,0-24,0)	
switch-off elect.	400	0	
Idle stop	1200 600 475	max. 5,0 max. 6,0 (4,0-12,0)	
End stop	400 500	min. 15,5 max. 21,5	
2.4 Solenoid	max. cut-in voltage rel. pulse width XXX	xxx min. 10 V rated voltage 12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-6,0
MS	1,3-1,5
SVS	2,5
* FH	1,8-2,4
*XK	18,4-20,4
*XL	9,6-12,7

Observations

*operating
stroke (KSB)

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Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 VWV 1,6 b 1

2. Edition

En

VE 4/9 F 2400 R 66

O 460 494 048

superseded 5.82

company: VWV

engine: 1,6 L

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-480/

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,9-3,3 mm		
1.2 Supply pump pressure	1500	4,9-5,5 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	31,5-32,5 cm ³ /1000 strokes		2,5 (0,3)
Full-load delivery with charge-air pressure	-	cm ³ /1000 strokes		
1.4 Idle speed regulation	415	6,6-10,0 cm ³ /1000 strokes		2,5 (0,3)
1.5 Start	100	min. 38,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2600	11,0-17,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,3 - 2,1 (1,0-2,4)	1500 (2,4-3,8)	2400 6,1-6,9 (5,8-7,2)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,1-2,7		2400 7,0-7,6
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138 (40-153)		2400 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2700 2600 2400 1500 600	2,5-9,5 (2,0-10,0) (10,0-18,0) 27,0-29,0 (25,7-30,3) (29,7-34,3) 19,5-22,5 (18,0-24,0)	
switch-off elect.	400	0	
Idle stop	1200 600 415	max. 3,0 max. 6,0 (4,0-12,0)	
End stop	400 500	min. 15,5 max. 21,5	
2.4 Solenoid	max. cut-in voltage xxxxxxx	xxx min. 10 V rated voltage 12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2 - 3,4
KF	5,7 - 5,9
MS	1,3 - 1,5
SVS	max. 2,5
FH *)	1,8 - 2,4
K	18,4 - 20,4
L	9,1 - 12,9

Observations

*operating
stroke (KSB)

Test Specifications

Distributor-type

Fuel-injection Pumps

VE 6/11 F 2100 L 63

0 460 416 014

supersedes 6.82

company: VM Cento

engine: HR 692 HT

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,2 mm \pm 0,02 (0,04)

see VDT-W-460/

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1800	6,5-6,9 mm	0,65	
1.2 Supply pump pressure	1800	6,6-7,2 bar (kgf/cm ²)	0,65	
1.3 Full-load delivery without charge-air pressure	600	36,0-40,0 cm ³ /1000 strokes	0	
Full-load delivery with charge-air pressure	1500	47,5-48,5 cm ³ /1000 strokes	0,65	3,5
1.4 Idle speed regulation	450	10,0-14,0 cm ³ /1000 strokes	0	3,0
1.5 Start	100	min. 42,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	2400	22,0-30,0 cm ³ /1000 strokes	0,65	
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA=0,65 bar	n = rev/min mm	1000 2,1-2,9(1,8-3,2)	1500 4,7-5,3(4,3-5,7)	1800 6,0-7,4)	2100 7,9-8,6(7,5-8,9)
2.2 Supply pump LDA= 0,65 bar	n = rev/min bar (kgf/cm ²)	400 1,7-2,3		2100 7,8-8,4	
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138 (40-153)		2100 55-138 (40-153)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2700	max. 1,0	
	2450	9,0-15,0 (7,5-16,5)	0,65
	2400	(21,5-30,5)	0,65
	2100	43,9-46,9 (42,5-47,9)	0,65
	1500	(45,3-50,7)	0,65
	* 600	38,5-41,5 (37,3-42,7)	0,27
	600	(34,6-41,4)	0
switch-off	2100	0	
Idle stop	700	max. 1,0	0
	550	2,0-8,0 (0,5-9,5)	0
	450	(7,5-16,0)	
End stop	350	min. 40,0	
	450	max. 45,0	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	--
KF	6,3-6,5
MS	0,9-1,1
SVS	max. 2,2
+ FH	1,8-2,4
X XK	20,2-22,2
X XL	10,8-13,1

Observations

+ Manifold-pressure
compensator stroke
= 4,0 mm.
Correction at the
adjusting nut.(46)

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 FIA 1,7 h

1. Edition

En

VE 4/10 F 2050 R 124

0 460 404 031

supersedes

company: Fiat

engine: 8144-81

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,2 mm \pm 0,02 (0,04)

see VDT-W-460V

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	6,7-7,1 mm	0,75	
1.2 Supply pump pressure	1500	6,1-6,7 bar (kgf/cm ²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	43,5-44,5 cm ³ /1000 strokes	0	
Full-load delivery with charge-air pressure	1500	61,5-62,5 cm ³ /1000 strokes	0,75	3,0
1.4 Idle speed regulation	350	12,5-16,5 cm ³ /1000 strokes	0	3,0
1.5 Start	100	min. 60 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	2200	22,0-28,0 cm ³ /1000 strokes	0,75	
1.7 Load-dependent start of delivery	1500	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA=0,75 bar	n = rev/min mm	600 2,4-2,8 (1,7-3,1)	1500 (6,2-7,6)	2050 8,6-9,4 (8,3-9,7)
2.2 Supply pump LDA=0,75 bar	n = rev/min bar (kgf/cm ²)	400 3,4-4,0	600 4,0-4,6	2050 7,4-8,0
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138 (40-153)		2050 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2400	max. 1,5	0,75
	2300	max. 5,0	0,75
	2200	(20,5-29,5)	0,75
	2050	53,1-56,1 (51,9-57,3)	0,75
	1500	(59,3-64,7)	0,75
	* 800	54,5-55,5 (51,6-58,4)	0,2
	600	(40,6-47,4)	0
switch-off			
	2050	0	
Idle stop	350	(10,0-19,0)	
	450	max. 3,5	
	500	max. 2,0	
End stop	350	min. 55	
	450	max. 55	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,7-6,0
MS	1,2-1,4
SVS	3,2
A XK	25,0-27,0
B XL	9,8-13,1

Observations

* Manifold-pressure
compensator stroke
= 4,0 mm.
Correction at the
adjusting nut.(46)

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 VMA 3,6 a 1

1. Edition

En

VE 6/11 F 1900 L 63-1

supersedes

company: VM-Motori

engine: HR 6 H

0 460 416 029

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test instructions and Test Equipment

Pre-stroke setting 0,2 mm \pm 0,02 (0,04)

see VDT-W-460/...

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	3,8-4,2 mm	0,75	
1.2 Supply pump pressure	1500	4,9-5,5 bar (kgf/cm ²)	0,75	
1.3 Full-load delivery without charge-air pressure	600	42,3-43,3 cm ³ /1000 strokes	0	
Full-load delivery with charge-air pressure	1500	61,0-62,0 cm ³ /1000 strokes	0,75	3,0
1.4 Idle speed regulation	350	20,0-24,0 cm ³ /1000 strokes	0	3,0
1.5 Start	100	min. 40,0 cm ³ /1000 strokes	0	
1.6 Full-load speed regulation	2100	20,0-26,0 cm ³ /1000 strokes	0,75	
1.7 Load-dependent start of delivery	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device LDA=0,75 bar	n = rev/min mm	1000 0,9-1,7 (0,6-2,0)	1500 (3,3-4,7)	1850 5,6-6,4 (5,3-6,7)
2.2 Supply pump LDA=0,75 bar	n = rev/min bar (kgf/cm ²)	600 2,0-2,6		1850 6,0-6,6
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138 (40-153)		1900 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2200 2100 2000 1850 1500 * 600 600	max. 1,5 (18,5-27,5) 44,0-50,0 (42,5-51,5) 56,7-59,3 (55,3-60,7) (58,8-64,2) 46,2-47,2 (43,3-50,1) (39,4-46,2)	0,75 0,75 0,75 0,75 0,75 0,3 0
switch-off	1900	0	
Idle stop	350 400 450	(17,5-26,5) 7,5-12,5 (5,5-14,5) max. 3	
End stop	400 500	min. 49 max. 44	
2.4 Solenoid	max. cut-in voltage XXX min. 10,0 V rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	6,3-6,6
MS	0,9-1,1
SVS	max. 4,3
A XK	20,2-22,2
B XL	13,0-16,4

Observations

* Manifold-pressure
compensator stroke
= 4,0 mm.
Correction at the
adjusting nut.(46)

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Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 FOR 2,3 a

2. Edition

En

VE 4/10F 1800 R 14

0 460 404 001

 superseded 4.82
 company: Ford
 engine: CID 144

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm + 0,02 (0,04)

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1600	3,8 - 4,2 mm		
1.2 Supply pump pressure	1600	5,5 - 6,1 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1250	40,5 - 41,5 cm ³ /1000 strokes		3,0
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	425	14,0 - 18,0 cm ³ /1000 strokes		3,0
1.5 Start	100	min. 70 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2050	9,0 - 15,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 0,5-1,5(0,3-1,7)	1600 (3,3-4,7)	1800 4,5-5,3(4,2-5,6)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 1,7-2,3		1800 6,0-6,6
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138(40-153)		1800 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2170-2260 2050 1900 1750 1250 800	0 (8,0-16,0) 31,0-37,0 (30,0-38,0) 38,0-40,0 (36,7-41,3) (38,7-43,3) 37,5-40,5 (36,0-42,0)	
switch-off	1800	0	
Idle stop	600-700 425	0 (12,0-20,0)	
End stop	215 285	min. 70 max. 35	
2.4 Solenoid	max. cut-in voltage xxx min. 10 V test voltage xxx rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,7-5,9
MS	2,0-2,2
SVS	max. 4,2
A	7,7-12,7
S	8,7-11,9

Observations

For further details
see overleaf

Set by means of notched plate
Setting of the upper notched plate at a plunger of 0,36 mm
related to outlet "A".

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 FOR 2,3 b
2. Edition

En

VE 4/10F 1800 R 15
0 460 404 002

supersedes 4.82
company: Ford
engine: CID 144

Testoil-ISO 4113

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm \pm 0,02 (0,04)

see VDT-W-460v.

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1600	3,8-4,2 mm		
1.2 Supply pump pressure	1600	5,5-6,1 bar (kgf/cm ²)		3,0
1.3 Full-load delivery without charge-air pressure	1250	40,5-41,5 cm ³ /1000 strokes		
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	425	14,0-18,0 cm ³ /1000 strokes		3,0
1.5 Start	100	min. 70 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2050	9,0-15,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-			

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 0,5 - 1,5 (0,3-1,7) (3,3-4,7)	1600 4,5-5,3 (4,2-5,6)	1800
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 1,7-2,3		1800 6,0-6,6
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138 (40-153)		1800 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2170-2260 2050	0 (8,0-16,0)	
	1900	31,0-37,0 (30,0-38,0)	
	1750	38,0-40,0 (36,7-41,3)	
	1250	(38,7-43,3)	
	800	37,5-40,5 (36,0-42,0)	
switch-off	1800	0	
Idle stop	600-700	0	
	425	(12,0-20,0)	
End stop	215 285	min. 70 max. 35	
2.4 Solenoid	max. cut-in voltage test voltage		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,7-5,9
MS	2,0-2,2
SVS	max. 4,2
A	7,7-12,7
B	8,7-11,9

Observations

For further details
see overleaf

Set by means of notched plate
Setting of the upper notched plate at a plunger of 0,36 mm
related to outlet "A".

Test Specifications Distributor-type Fuel-injection Pumps

VE 4/10 F 1800 R 14-1
0460 404 005
VE 4/10 F 1800 R 15-1
0460 404 006

supersedes -
company: Ford
engine: 144 c/D

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,2 mm \pm 0,02 (0,04) mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1600	3,8-4,2 mm		
1.2 Supply pump pressure	1600	5,5-6,1 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1250	40,5-41,5 cm ³ /1000 strokes		3,0
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	425	14,0-18,0 cm ³ /1000 strokes		3,0
1.5 Start	100	min. 70 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2050	9,0-15,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 0,5-1,5 (0,3-1,7)	1600 (3,3-4,7)	1800 4,5-5,3 (4,2-5,6)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 1,7-2,3		1800 6,0-6,6
Overflow delivery	n = rev/min cm ³ /10 s	500 55-138 (40-153)		1800 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2170-2260	0	
	2050	(8,0-16,0)	
	1900	31,0-37,0 (30,0-38,0)	
	1750	37,0-39,0 (35,7-40,3)	
	1250	(38,7-43,3)	
	800	39,5-42,5 (38,0-44,0)	
switch-off	1800	0	
Idle stop	425	(12,0-20,0)	
	630-690	0	
End stop	215	min. 70	
	285	max. 35	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,7-5,9
MS	2,0-2,2
SVS	max. 4,2
A XK	19,3-21,3
B XL	6,9-10,2

Observations

For further details
see overleaf

Set by means of notched plate
Setting of the upper notched plate at a plunger of 0,36 mm
related to outlet "A".

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 13,8 n 1
1. Edition

En

PE 8 P 120 A 920/5 LS 3812 RQV 300-1050 PA 475

supersedes
company Fiat
engine: 8281.22.050

1-8-4-3-6-5-7-2 ie $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

Komb.-Nr.
0 401 848 749

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,5-3,6}
(3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	10,9+0,1	20,7-21,1	0,5(0,9)			
300	4,9-5,1	1,7-2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1080	15,2-17,8	-	-	-	ca. 10	100 300	min. 7,5 5,9-6,1	300 450 800	1,6-1,7 3,5-4,2 6,1-6,3
ca. 60	9,9 4,0 1300	1090-1100 1180-1210 0 - 1,0				310-415 ③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control rod stop Test oil temp 40°C (104°F) (2)		Rotational speed limitation intermediate speed (2b)	Fuel delivery characteristics high idle speed (5b)		Starting fuel delivery idle switching point (6)		Torque-control travel (5)	
rev/min	cm³/1000 strokes	rev/min (4a)	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1050	0,7 bar 207,0-211,0 (204,0-214,0)	1090-1100*	LDA 1050	0 bar 149,0-153,0 (145,5-156,5)	100	230,0-250,0 (226,0-254,0)	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

BOSCH

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

PIA 13,8 n 1 -2-

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 8 P .. LS 3812 + RQV .. PA 475	0,70	0 0,30 0,25	10,9-11,0 8,5-8,6 10,4-10,5 9,1-9,4

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4
3. Edition

MB 17,4a

En

Testoil-ISO 4113

PE 10 P 100 A 320 LS 842 RQ 300/1150 PA 187-1 R

supersedes 2.80

company: Daimler Benz

engine: OM 403

235,4 kW (320 PS)

10- 9- 4- 1- 8- 7- 6- 3- 5- 2 $\pm 0,50^{\circ}$
0-45-72-117-144-189-216-261-288-333 (0,75 $^{\circ}$)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke		(3,40-3,50)		mm (from BDC)		Zy1.10	
Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)	
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm	
1	2	3	4	2	3	6	
1150	11,4-11,5	10,1 - 10,3	0,3(0,6)				
300	8,0-8,2	1,4 - 2,0	0,3(0,5)				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control	
PRG check		Setting point		Test specifications		Setting point		Test specifications			
rev/min	Control rod travel	rev/min	Control rod travel	Control rod travel	rev/min	rev/min	Control rod travel	rev/min	Control rod travel	rev/min	Control rod travel
1	mm	3	mm	mm	6	7	mm	9	mm	11	mm
650	13,8-14,6	650	14,2	10,4	1195-1210	300	8,1	100	min. 10,6	1150	11,4-11,5
1350	0-1			4,0	1245-1275			300	8,0-8,2	600	11,4-11,6
								425-465=2,0			

Torque-control travel

on flyweight assembly dimension a =

mm

Speed regulation: At

1195-1210 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever		Control rod stop		Fuel delivery characteristics		Starting fuel delivery	
Test oil temp. 40°C (104°F)						Idle speed	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3		4	5	6	7
1150	101,0 - 103,0 (99,0 - 105,0)	600		-	-	100	125,0 - 15,0

Checking values in brackets

2.83

Test Specifications

Fuel Injection Pumps ②

and Governors

Testoil-ISO 4113

PE 10 P 110 A 520/4 LS 846

RQ 250/1150 PA 561

superseded 2.82

company: MAN

engine: D 2540 MT

323 kW (439 PS)

1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 - 9 - 4

0 - 27 - 72-99-144-171-216-243-288-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(2,95-3,15)

mm (from BDC) 1. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,9+0,1	14,0 - 14,2	0,4 (0,8)			
250	6,9-7,1	1,1 - 1,7	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 4 rev/min 6		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 8 rev/min 10		Torque control rev/min 11 Control rod travel mm 12	
600	19,2-20,8	600	20,0	10,9	1195-1210	250	7,0	100	min. 8,5	1150	11,9-12,0
VH = max. 46°				4,0	1300-1330			250	6,9-7,1	600	11,9-12,1
				1450	0 - 1,0			350-390	= 2,0 mm		

Torque-control travel
on flywheel assembly dimension a =

mm

Speed regulation: 1195-1210 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F) rev/min 1 cm ³ /1000 strokes 2		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4 cm ³ /1000 strokes 5		Starting fuel delivery Idle speed rev/min 6 cm ³ /1000 strokes / mm 7	
LDA 1150	0,9 bar 140,0 - 142,0 (137,0 - 145,0)	-		LDA 750	0,9 bar 134,0 - 138,0 (131,0 - 141,0)	100	145,0 - 175,0
				LDA 500	0 bar 115,0 - 118,0 (112,0 - 121,0)		

Checking values in brackets

2.83

D. Adjustment Test for Manifold Pressure Compensator

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure
increasing

MAN 17,4 a 1

-2-

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE10P..LS 846 + .. PA 561	0,9	0 0,38 0,33	11,9 - 12,0 11,1 - 11,2 11,7 - 11,8 11,3 - 11,5

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications

Fuel Injection Pumps ②

and Governors

WPP 001/4 FIA 13,8 o
4. Edition

En

Testoil-ISO 4113

PE 8 P 120 A 920/5 LS 3804 RQ 300/950 PA 474

supersedes 2.82
company Fiat
engine: 8280.22.007

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,5 3,6} (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
950	10,9+0,1	20,5 - 20,9	0,5(0,9)			
300	4,9-5,1	1,9 - 2,5	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600 VH:	19,2-20,8 max. 49°	600	20,0	9,9 4,0 1150	995-1010 1030-1060 0 - 1,0	300	5,0	100 300 350-390	min. 7,5 4,9-5,1 =2,0mm	950 600	11,1-11,2 11,1-11,3

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: 995-1010 min⁻¹

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes / mm 7
LDA 950	0,7 bar 205,0-209,0 (202,0-212,0)	-	LDA 950	0 bar 149,0-153,0 (146,0-156,0)	100	19,5-21,0 mm RV

Checking values in brackets

2.83

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

FIA 13,8 o -2-

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 8 P.. LS 3804 + ..PA 474	0,70	0 0,35 0,28	10,9 - 11,0 8,3 - 8,4 10,3 - 10,4 9,0 - 9,3

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications

Fuel Injection Pumps ②

and Governors

WPP 001/4 FIA 13,8 p
3. Edition

En

PE 8 P 120 A 920/5 LS 3804 RQ 300/1200 PA 356 R
1-8-4-3-6-5-7-2 je $45^{\circ} \pm 45^{\circ} \pm 0,50$ ($\pm 0,75^{\circ}$)
Komb.-Nr. 0 401 848 719
0 401 848 715

supersedes 2.81
company: Fiat
engine: 8280.02.405

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $3,5-3,6$ mm (from BDC)
(3,45-3,65)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	9,3-9,4	17,3-17,7	0,5(0,9)			
300	5,9-6,1	2,8-3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
650	15,6-16,4	650	16,0	8,3 4,0 1400	1245-1260 1280-1310 0 - 1,0	300	6,0	100 300 400-	min. 7,5 5,9-6,1 440 = 2,0	1200 650	9,3-9,4 9,3-9,5

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At 1245-1260 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
②		③a		③b		⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
1200	173,0-177,0 (170,0-180,0)	-		-	-	100	19,5-21,0

Checking values in brackets

2.83

Test Specifications

Fuel Injection Pumps ②

and Governors

WPP 001/4 RAB 9,7 b

1. Edition

En

PES 6 A 95 D 420 LS 2595 RQ 200/1100 AB 1094-1 R
Komb.-Nr. 0 400 846 514

supersedes

company: RABA

engine: D 2356 HM 6 U
162 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke

^{2,0-2,1}
(1,95-2,15)

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,3+0,1	12,1-12,3	0,3(0,6)			
200	6,0-6,2	0,8-1,4	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2		Test specifications Control rod travel mm 4		Test specifications rev/min 6		Test specifications Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 12	
550 VH =	19,2-20,8 max. 46°	550	20,0	10,3	1145-1160	200	6,0	100	min. 7,5	1100	11,3-11,4
				4,0	1175-1205			200	5,9-6,1		
								290-	330=2,0		
								350	max. 1,0		
										750	11,7-11,9
										855	11,5-11,7

Torque-control travel
on flyweight assembly dimension a = 0,3 mmSpeed regulation: At 1145-1160 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery idle speed rev/min 6	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7	
1100	121,0-123,0 (119,0-125,0)	500		800	122,0-125,0 (119,5-127,5)	100	17,5-18,1
				500	max. 117,0 (max. 119,0)		

Checking values in brackets

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MAN 17,4 b

1. Edition

En

PE 10 P 110A520/5 LS 850 RQ 750 PA 404-3

supersedes-

company: MAN

engine: D 2540 MTE

235 kW (320 PS)

Testoil ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\overset{3,0-3,1}{(2,95-3,15)}$ mm (from BDC) = RW 9,0-12,0 mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
700	12,9+0,1	15,2-15,4	0,4(0,8)			
250	6,9-7,1	1,1-1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
-	-	-	-	11,9 6,6 900	750-755 780-790 0 - 1,0	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At $750-755 \text{ min}^{-1}$ 1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a	③b		⑥	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3	4	5	6	7
700	152,0-154,0 (149,0-157,0)	-	-	-	100	19,5-21,0

Checking values in brackets

1.83

BOSCH

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G7

57

Test Specifications

Fuel Injection Pumps ②

and Governors

WPP 001/4 MAN 11,1 q 10
1. Edition

En

PES 6 P 110 A 720 LS 375 RQ 750 PA 638

Komb.-Nr. 0 402 046 237

supersedes

company: MAN

engine: D 2566 MTE
147 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,0 - 3,1$
(2,95-3,15) mm (from BDC) Zyl. 6 = RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,5+0,1	15,6-15,8	0,4 (0,8)			
250	6,7-6,9	1,0-1,6	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Test specifications Control rod travel mm 5	rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications Control rod travel mm 9	rev/min 10	rev/min 11	Control rod travel mm 12
-	-	-	-	11,5 4,0 900	750-755 780-790 0-1,0	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a = mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery idle speed	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7
700	156,0-158,0 (153,0-161,0)	-	-	-	100	19,5-21,0

Checking values in brackets

3.83

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MB 16,0c

7. Edition

En

Testoil-ISO 4113

PE 10 P 100 A 320 LS 811 RQ 300/1250 PA 187 R

 supersedes 6.80
 company: Daimler-Benz
 OM 403

 1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 - 9 - 4
 0 - 27 - 72 - 99 - 144 - 171 - 216 - 243 - 288 - 315⁰±0,5⁰(±0,75⁰)

 Komb.- Nr.
 0 401 849 133

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke (3,35-3,55) mm (from BDC) Zyl. 10
 3,40-3,50

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	10,1 - 10,3	10,0 - 10,2	0,3(0,6)			
300	7,4-7,6	1,8 - 2,4	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Control rod travel mm 2		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5 rev/min 6		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 9 rev/min 10		Torque control rev/min 11		Control rod travel mm 12	
650		13,8-14,6		650	14,2	9,1 4,0 1450	1295-1310 1335-1365 0 - 1,0	300	7,5	100 300 405-445=2,0	min. 9,0 7,4-7,6	1250 650		10,1-10,2 10,1-10,3	

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery idle speed rev/min 6	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes / mm 7	
1250	100,0 - 102,0 (98,0 - 104,0)	600		600	77,0 - 82,0 (75,0 - 84,0)	100	110 - 130

Checking values in brackets

2.83

Test Specifications

Fuel Injection Pumps ②

and Governors

WPP 001/4 MB 10,8a 1
1. Edition

En

PE6P100A720RS5

RO 250/1100 PA 9 DR

supersedes -

company: Daimler-Benz

OM 355

engine: 154,5 kW (210 PS)

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,8-2,9) (2,75-2,95) mm (from BDC) RW 9,0- 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1090	12,0+0,1	9,9-10,1	0,3(0,6)			
250	7,9-8,1	1,7-2,3	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 4		rev/min 6		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 9		rev/min 10		Torque control rev/min 11		Control rod travel mm 12	
600	15,6-16,4	600	16,0	11,0	1145-1160	250	6,0	100	min. 7,5	1090	12,0-12,1						
				4,0	1185-1215			250	5,9-6,1	450	12,6-12,7						
				1350	0 - 1,5			385-425	2,0	700	12,4-12,6						

Torque-control travel
on flyweight assembly dimension a = 0,2 mm

Speed regulation: At 1145-1160 min⁻¹

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
1090	99,0-101,0 (97,0-103,0)	-	-	450	88,0-92,0 (86,0-94,0)	100	150,0-170,0
				700	98,0-102,0 (96,0-104,0)		

Checking values in brackets

2.83

Test Specifications

Fuel Injection Pumps ②

and Governors

WPP 001/4 MB 11,4 r

1. Edition

En

PES 6 P 110 A 820 LS 459

RQ 350/1050 PA 655

Komb.-Nr. 0 402 046 248

supersedes

company Daimler-Benz

engine: OM 407 h

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

3,2-3,3
(3,15-3,35)

mm (from BDC) Zyl. 6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	9,5-9,6	9,9-10,1	0,4(0,8)			
350	6,6-6,8	1,4-2,0	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point		Setting point		Test specifications		Setting point		Test specifications		Control rod travel	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	13,1-13,9	600	13,5	8,5 4,0 1250	1095-1100 1145-1175 0 - 1,0	350	6,7	100 350 370-410	min. 8,1 6,6-6,8 = 2,0	1050 900 600	9,5-9,6 9,7-9,9 10,3-10,5

Torque-control travel
on flyweight assembly dimension a = 0,4 mmSpeed regulation: At 1095-1100 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min 1	cm ³ /- 1000 strokes 2	rev/min 3	rev/min 4	cm ³ /- 1000 strokes 5	rev/min 6	cm ³ /1000 strokes / mm 7	Control rod travel
1050	99,0-101,0 (96,0-104,0)	-	600	90,0-94,0 (87,0-97,0)	100	130,0-150,0	

Checking values in brackets

2.83

Testoil-ISO 4113

Test Specifications

Fuel Injection Pumps ②

and Governors

PE 6 A 90 D 410 RS 2124

RQ 300/1250 AB 812 DL

supersedes 9.82

company: Daimler-Benz

engine: OM 360

141 kW (192 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,15-2,25$ mm (from BDC)
 $(2,10-2,30)$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	10,2+0,1	8,6 - 8,7	0,3 (0,45)			
300	6,3-6,5	1,2 - 1,8	0,2 (0,4)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2		Control rod travel mm 4		Test specifications rev/min 6		Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 12	
700	15,6-16,4	700	16,0	9,2 4,0	1295-1310 1345-1375	300	6,4	100 300 370-410 = 2,0 500	min.7,9 6,3-6,5 max.1,0	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1295-1310 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes / mm 7	
1250	86,0-87,0 (84,0-89,0)	-		800	80,0-83,0 (78,0-85,0)	100	19,0-21,0 mm RW

Checking values in brackets

3.83

①

Test Specifications

Fuel Injection Pumps ① and Governors

WPP 001/4 BAO 10,6 a

1. Edition

En

PES 4 P 120A 320 RS 451

RQV 350-900 PA 618

supersedes

company: Baudouin

engine: DNP 4

107 kW (145 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,75-2,95) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
900	11,0+0,1	17,6-18,0	0,5(0,8)			
350	7,2-7,4	2,2-2,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	940	15,2-17,8	-	-	-	ca. 30	100	min. 8,8	300	0,7-1,0
							350	7,2-7,4	500	3,2-3,8
ca. 59	10,0	940-950							700	5,5-5,9
	4,0	990-1020							900	8,0
	1150	0 - 1,0				350-440				
						③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed	Fuel delivery characteristics		Starting fuel delivery		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	high idle speed	cm ³ /1000 strokes	idle switching point	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
900	176,0-180,0 (173,0-183,0)	940-950*	-	-	-	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

Testoil-ISO 4113

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G13

G13

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 OMB 8,1d
2-Edition

En

Testoil-ISO 4113

PES 6 MW 100/720 RS 1012 RQV 425-1100 MW 36
0 403 446 127

supersedes 82
company OM-Brescia
engine: 8365.25.580
129 kW (175 PS)

1 - 5 - 3 - 6 - 2 - 4
0 - 60 - 120 - 180 - 240 - 300 ± 0,5(0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,90-3,00}{(2,85-3,05)}$ mm (from BDC) RW 10,5 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,5+0,1	9,6 - 9,8	0,35(0,6)			
425	5,8-6,0	1,15 - 1,55	0,35(0,55)			
700	12,4+0,1		0,5 (0,7)			
500	11,2+0,1		0,35(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel ①	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1100 1300	15,2-17,8 0 - 1,0	-	-	-	ca. 14	425 100	5,8-6,0 min.7,5		
ca.49	10,5 4,0	1140-1150 1185-1215				③a	470-530=	2,0		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1100	0,5 bar 96,0-98,0 (94,0-100,0)	1140 - 1150 *	LDA 700	0,5 bar 101,0-105,0 (99,0-107,0)	100	RW max.19 min.160,0	700 1000	12,4+0,1 11,5+0,1
			LDA 500	0 bar 75,0-77,0 (73,0-79,0)	100-220 (80-240)			

Checking values in brackets

* 1 mm less control rod travel than col 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n =

500

/min decreasing pressure - in bar gauge pressure

XXXXXXXXXXXX

OMB 8,1 d -2-

Pump/governor	g	Measurement	Control rod travel	diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)	
RS 1012 + RQV-MW 36	0,27	0,2	12,1 - 12,2	
		0,5	11,5 - 11,7	
		0	12,4 - 12,5	
			11,2 - 11,3	

Notes.

(1) when n =

rev/min and

gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 MAN 20,9c

3. Edition

En

Testoil-ISO 4113

PE 12 P 120 A 520 LS 836

RQV250-1150PA353R

supersedes 80

comp MAN

engine D2542MLE

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7

0 - 45 - 60 - 105 - 120 - 165 - 180 - 225 - 240 - 285 - 300 - 345^{0+0,5°} (-0,75°) 478,0 (650 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke 3,00-3,10 mm (from BDC) Zyl. 12
 (2,95-3,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,3-11,4	18,5 - 18,8	0,5(0,9)			
250	6,7-6,9	2,2 - 2,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
MAX.	1150	15,2-17,8	-	-	-	ca. 11	100	min. 8,3	200	0,6-0,9
	1450	0 - 1,0					250	6,7-6,9	520	3,2-3,7
									830	5,7-6,0
ca. 66	10,3	1190-1200					520-580	= 2,0	1150	8,1
	4,0	0 - 1,0				③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1150	185,0-188,0 (182,0-191,0)	1190-1200*			100	200,0-220,0 100-170 (80-190)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

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①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 BAO 13,2 a

1. Edition

En

PES 5 P 120 A 320 RS 452

RQV 350-900 PA 618

1 - 2 - 4 - 5 - 3 je $72^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

supersedes

company Baudouin

engine: DNP 5
132 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 - 2,9$
(2,75-2,95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	11,0+0,1	17,6-18,0	0,5 (0,8)			
350	7,2-7,4	2,2-2,8	0,8 (0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	940	15,2-17,8	-	-	-	ca. 30	100	min. 7,5	300	0,7-1,0
ca. 59	10,0 4,0 1150	940-950 990-1020 0-1,0				350-440	350	7,2-7,4	500 700 900	3,1-3,8 5,5-5,9 8,0

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
900	176,0-180,0 (173,0-183,0)	940-950*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

2.83

G17

G17

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①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 20,9 q

1. Edition

En

PE 12 P 110 A 520/4 LS 848 RQV 250-1200 PA 644

supersedes

company MAN

1- 5- 9- 8- 3 - 4 - 11- 10- 2 - 6 - 7 - 12
G-15-60-75-120-135-180-195-240-255-300-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)engine: D 2842 ME
338 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Komb.-Nr.

0 401 840 078

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{3,0-3,1}{(2,95-3,15)}$ mm (from BDC) $\frac{7}{12}$

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1200	11,9+0,1	12,5-12,7	0,4(0,8)			
250	7,0-7,2	0,9-1,5	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1230	15,2-17,8	-	-	-	ca.12	100	min.8,6	315	2,6-1,9
ca. 61	10,9	1240-1250					250	7,0-7,2	950	5,1-5,3
	4,0	1365-1395				425-550			1200	7,5

Torque control travel \pm - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1200	125,0-127,0 (122,0-130,0)	1240-1250*	-	-	100	150,0-170,0 (146,0-174,0)	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.33

G18

G18

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①

Test Specifications Fuel Injection Pumps ① and Governors

WPP001/4 KHD 4,7 b

2. Edition

En

PES 5 A 80 D 410/3 RS 2579 RQV 300-1400 AB 1048 DL

1-3-5-4-2 je $72^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

supersedes 9.82

company: KHD

F 5 L 912

engine: 74 kW (101 PS)
bei 2800 min⁻¹

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke (1,85-2,05) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 3
1400	11,4+0,	6,1-6,2	0,2(0,35)			
300	8,9-9,	1,0-1,6	0,2(0,3)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1400	15,2-17,8	-	-	-	ca. 10	100	min. 7,5	250	0-0,6
ca. 60	10,4	1480-1490					300	5,9-6,1	630	2,9-3,1
	4,0	1710-1740					750	max. 1,0	1020	5,0-5,3
	1850	0-1,0				390-490			1400	5,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1400	62,5-63,5 (61,0-65,0)	1480-1490*	900	59,5-61,5 (57,5-63,5)	100	120,0-130,0 bei 20,5-21,5 mmRW	1400	11,4+0,
			750	56,5-58,5 (55,0-60,0)			1075	11,5+0,
							825	12,0+0,
							500	12,4+0,

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 PEN 10,0 d 1

1. Edition

En

PE 6 P 110 A 320 RS 138

RSV 200-900 P 1/305 R

Komb.-Nr. 0 401 876 104

supersedes -

company

engine

Volvo-Penta

MD 100 B

114 kW (155 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,6 - 2,7
(2,55-2,75)

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	9,3-9,4	10,9-11,1	0,4 (0,8)			
225	5,4-5,5	1,0-1,4	0,3 (0,6)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed 4 5 6			④ Lower rated speed Control-lever deflection in degrees 7			③ Torque control Control rod travel mm 11	
Control rod travel mm 2	Control rod travel mm rev/min 3					rev/min 8	Control rod travel mm 9		rev/min 10	
loose	800	0,3-1,0	-	-	-	ca. 23	225	5,0	-	-
	x =	6,0					100	min.20,0		
							225	5,4-5,5		
ca. 48	8,3	940-950					310-370	= 2,0		
②a	4,0	970-1000								
	1100	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		⑥ Rotational-speed limit Note: changed to .) rev/min 3		③a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		④a Idle stop Control rod travel mm 9	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7		rev/min 8	
700	109,0-111,0 (106,0-114,0)	940-950*	-	-		100	310,0-330,0 = RW 20,0- 21,0 mm	0 -	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

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Testoil-ISO 4113

G20

G20

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4 VAL 3,3a
2. Edition

40

En

PES3A95D 320 RS 2655 RSV 325-1150 A 2 B 2178-1R

supersedes 11.82
company Valmet
engine 311 DS 6

1 - 2 - 3 je 120 • $\pm 0,5$ • ($\pm 0,75$ •)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,45-2,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	10,0 \pm 0,1	8,3 - 8,5	0,3 (0,6)			
325	7,0-7,2	0,9 - 1,5	0,3 (0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0 X = 6,0	-	-	-	ca. 28	325	6,7	1150	10,0-10,1
							100	min. 19,5	500	11,3-11,4
							325	7,1-7,3	915	10,6-10,8
							650-710	= 2,0		
ca. 54 2a	9,0	1190-1200								
	4,0	1290-1320								
	1455	0,3 - 1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp 40°C (104°F)		Note: changed to ...)							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
1150	82,5-84,5 (80,5-86,5)	1190-1200*	500	83,0-86,0 (81,0-88,0)	100	171,0 - 181,0 = 19,5-21,5 mm RW	-	-	

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 PEN 10,0 b 1

1. Edition

En

PE 6 P 100 A 320 RS 101 y RSV 200-900 P 4/305 R

Komb.-Nr. 0 401 876 263

supersedes

company

engine

Volvo-Penta

TD 100 A/PP

154 kW (209 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,6 - 2,7$ (2,55-2,75) mm (from BDC) RW 9,0 - 12,0 mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
700	12,0+0,1	13,6 - 13,8	0,3(0,6)			
200	5,5-5,7	1,1 - 1,5	0,2(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 18	200	5,1	-	-
	x = 4,0						100	min. 20,0		
							200	5,5-5,7		
ca. 51	11,0	940-950					260-320	= 2,0		
2a	4,0	970-1000								
	1135	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note: changed to 1 rev/min				Idle			
rev/min	cm ³ /1000 strokes	3		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2			4	5	6	7	8	9
700	136,0-138,0 (133,0-141,0)	940-950 *	-	-	-	100	230,0-260,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

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Testoil-ISO 4113

Test Specifications Fuel Injection Pumps 1A and Governors

40

WPP 001/4 MWM 14,4 a 1

1. Edition

En

PE 8 P 120 A 520/5 RS 427 RSUV 300-750 P 10 A 320

supersedes MWM

company D 234-V 8

engine

1- 8-5 -4 - 7 - 2 - 3 - 6
0-30-90-120-180-210-270-300 ° ± 0,5 ° (± 0,75 °)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,8-2,9 mm (from BDC))
(2,75-2,95)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
750	9,7-9,8	17,1-17,5	0,5 (0,9)			
300	6,5-6,7	2,8-3,6	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	.	-	ca. 21	300	6,1	750	9,7-9,8
	x = 2,75						300	6,5-6,7	450	9,7-9,8
ca. 55	8,7	790-800					320-380	= 2,0	320	10,9-11,5
2a	4,0	800-830								
	950	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note: changed to 1 rev/min				Idle			
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
750	171,0-175,0 (168,0-178,0)	790-800*	-	-	100	19,5-21,0 mm RW	-	-	

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

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Testoil-ISO 4113

Test Specifications Fuel Injection Pumps and Governors

40

1A WPP 001/4 MB 11,4 1 6
1. Edition

En

PES 6 P 110 A 820 LS 442-1 RSV 350-1100 P 0/485

supersedes
company Daimler-Benz
OM 407
engine 177 kW (241 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,2 - 3,3
(3,15-3,35) mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,7+0,1	12,5-12,7	0,4 (0,8)			
350	7,8-8,0	1,4-2,0	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	-	-	-	-	-
	x	= 3,0								
ca. 48	10,7	1140-1150								
2a	4,0	1220-1250								
	1250	0,3-1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min				Idle			
rev/min 1	cm ³ /1000 strokes 2	3	4	5	6	7	8	9	10
1100	125,0-127,0 (122,0-130,0)	1140-1150*	600	117,0-121,0 (114,0-124,0)	100	140,0-160,0	-	-	-

Checking values in brackets

* 1 mm less control rod travel than col 2

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1.83

Test Specifications Fuel Injection Pumps (1A) and Governors

40

HPP 001/4 DAF 11,6 D

1. Edition

En

PE 6 P 120 A 320 RS 443 RSV 250-1100 P 5/458 R

supersedes DAF

company

engine DKS 1160

235 kW (320 PS)

See service Information VDT-I-DAF 004

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 - 2,9$
($2,75 - 2,95$) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
850	10,9+0,1	19,1-19,5	0,5(0,9)			
250	6,2-6,4	1,1-1,5	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel	Control rod travel				Control lever deflection in degrees	rev/min	Control rod travel	rev/min	Control rod travel
1	mm	mm rev/min	4	5	6	7	8	mm	10	mm
loose	800	0,3-1,0	-	-	-	ca. 24	250	5,8	400	11,1-11,2
	x = 5,0						250	6,2-6,4	300	11,3-11,8
ca. 54	9,9	1140-1150					620-680	= 2,0		
2a	4,0	1260-1290								
	1425	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to 1 rev/min				Idle			
rev/min	cm ³ /1000 strokes	3	rev/min	cm ³ /1000 strokes	5	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2		4			6	7	8	9
LDA	0,7 bar	1140-1150*	LDA	0 bar		100	315,0-355,0	-	-
850	191,0-195,0 (188,0-198,0)		600	133,0-137,0 (130,0-140,0)			= 19,5 - 21,0 mm RW		

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

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Testoil-ISO 4113

H1

H1

D. Adjustment Test for Manifold Pressure Compensator

DAF 11,6 D

- 2 -

Test at n = 600 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P..RS 443 + RSV..P 5/458 R	0,36	0,70	10,6 - 10,7
		0	10,9 - 11,0
		0,28	9,8 - 9,9
			10,0 - 10,2

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

WPP 001/4FOR **40**
5,9 f 2
1. Edition

En

PES 6 A 90 D 210 RS 2629 RSV 350-1300 AOB 2143 L

supersedes
company Ford
engine Dover 363

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,65-2,85)

At port closing the locating pin must engage in the slot of the pointer.
mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	11,7+0,1	5,9-6,0	0,3(0,45)			
350	7,2-7,4	0,7-1,3	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 40	350	6,8	1250	11,7-11,8
	x =	3,5					100	min. 19,0	700	11,9-12,0
ca. 71	10,7	1370-1380					350	7,2-7,4		
②	4,0	1515-1545					580-640	= 2,0		
	1680	0,3-1,7					700	max. 1,0		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery idle		④a Idle stop	
Test oil temp 40°C (104°F)		Note changed to) rev/min							
rev/min 1	cm ³ /1000 strokes 2	3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
1250	58,5-59,5 (56,5-61,5)	1370-1380*	-	-	100	19,5-21,0 mm RW	-	-	

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 18,3 d

2. Edition

En

Testoil-ISO 4113

PE 10 P 110 A 320 LS 3818 RQV 300-1150 PA 486-2

1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 - 9 - 4
0 -27 -72 -99 -144-171-216-243-288-315° ± 0,5° (± 0,75°)

supersedes 82
Daimler-Benz
company OM 423

engine: 261 kW (355 PS)

Komb.-Nr. 0 401 849 706

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 4,0 - 4,1 mm (from BDC) Zyl. 10
(3,95-4,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	12,1+0,1	12,5 - 12,7	0,4(0,8)			
300	8,5-8,7	1,4 - 2,2	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 19	100	min.10,2	250	1,0-1,2
ca. 65	11,1	1190-1200				330-470	300	8,5-8,7	550	3,4-3,7
	4,0	1240-1270							850	4,9-5,3
	1400	0 - 1,0							1150	7,6

Torque control travel a = 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ③b		Starting fuel delivery idle switching point ④		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	cm ³ /1000 strokes 4a	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1150	125,0-127,0 (122,0-130,0)	1190-1200 *	600	115,0-119,0 (112,0-122,0)	100	130,0-150,0	1150	12,1+0	1
			900	116,0-121,0 (113,0-124,0)			600	12,5+0	1
							900	12,4+0	2

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

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H4

Test Specifications

Fuel Injection Pumps ① and Governors

WPP 001/4 MB 16,0 i

3. Edition

En

PE 10 P 100 A 320 LS 811 RQV 300-1250 PA 227 R

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4

0-27-72-99-144-171-216-243-288-315 ° ± 0,5 ° (± 0,75 °)

superseded 2.82

company: Daimler-Benz

engine: OM 403

Komb.-Nr.

0 401 849 136

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at portstroke 3,4-3,5 mm (from BDC) Zyl. 10
(3,35-3,55)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	10,3+0,3	10,0-10,2	0,3(0,6)			
300	7,4-7,6	1,8-2,4	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel ①	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1250	15,2-17,8	-	-	-	ca. 12	100	min. 9,0	250	0,7-1,0
ca. 66	9,3	1290-1300					300	7,4-7,6	580	3,4-3,7
	4,0	1330-1360					630-690 = 2,0		920	5,2-5,6
	1450	0 - 1,0							1250	8,0

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥	Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	rev/min 8	Control rod travel mm 9
1250	100,0-102,0 (98,0-104,0)	1290-1300 *	600	78,0-83,0 (76,0-85,0)	100	120,0-140,0	

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

Testoil-ISO 4113

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H5

H5

①

Test Specifications

Fuel Injection Pumps ①

and Governors

Fiat 13,8k

3. Edition

En

Testoil-ISO 4113

PE 8 P 120 A 920/5 LS 3804

RMV300 -1200 PA 357 R

supersedes 2.81

company Fiat

engine 8280.02.183

257 kW (350 PS)

 1 - 8 - 4 - 3 - 6 - 5 - 7 - 2
 0 -45 -90 -135-180-225-270-315^{±0,5°} (±0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(3,45-3,65)

Port closing at prestroke

3,50-3,60

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	9,3-9,4	17,3 - 17,7	0,5(0,9)			
300	5,9-6,1	2,8 - 3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
MAX.	1200	15,2-17,8				ca. 10	100 300	min.7,5 5,9-6,1	300 800 1200	1,4-1,5 5,2-5,5 8,3
ca. 63	8,3 4,0 1450	1240-1250 1315-1345 0 - 1,0				340-445 (3a)				

Torque control travel a =

mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b ④a	Fuel delivery characteristics high idle speed ⑤a ⑤b	Starting fuel delivery idle switching point ⑥	Torque-control travel ⑤ Control rod travel mm			
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
1200	173,0-177,0 (170,0-180,0)	1240-1250*			100	19,5-21,0 mm PW		

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.93

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H6

H6

①

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 FIA 13,8 m

5. Edition

En

Testoil-ISO 4113

PE 8 P 120 A 920/5 LS 3804

RQV 300-950 PA 475

supersedes 1.82

company Fiat

engine 8285.22

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2

0 -45 -90 -135-180-225-270-315 $\pm 0,5^{\circ}(\pm 0,75^{\circ})$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke (3,45-3,65)
 3,50-3,60 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
950	11,1+0,1	1 20,7 - 21,1	0,5(0,9)			
300	4,9-5,1	1,5 - 2,1	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
MAX.	950	15,2-17,8	-	-	-	ca. 11	100	min. 7,5	300	2,0-2,1
ca. 64	10,1 4,0 1250	990-1000 1075-1105 0 - 1,0					300	5,9-6,1	400	3,1-3,5
							300-390=2,0		1000	8,3

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational speed limb intermediate speed 4a		Fuel delivery characteristics high idle speed 5a		Starting fuel delivery idle switching point 6		Torque-control travel Control rod travel mm 5	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
LDA 950	0,7 bar 207,0-211,0 (204,0-214,0)	990-1000*		LDA 950	0 bar 142,0-146,0 (139,0-149,0)	100	19,5-21 mmR ₁₇		
							Electromagnet 24V		

Checking values in brackets

* 1 mm less control rod travel than coil 2

2.83

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H7

H7

D. Adjustment Test for Manifold Pressure Compensator

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure
increasing
XXXXXX

FIA 13,8 m

-2-

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
.. LS 3804 + RQV..PA 475	0,7	0,35 0,28 0	11,1 - 11,2 10,4 - 10,5 9,0 - 9,3 8,3 - 8,4

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications

Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 13,8 I
3. Edition

En

Testoil-ISO 4113

PE 8 P 120 A 920/5LS 3804 RQV300-1050PA475

supercedes 81

company Fiat

engine 8295.22.002

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2
0 - 45 - 90 - 135 - 180 - 225 - 270 - 315 $\pm 0,5 (0,75)^0$

243 kW (330 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,45 - 3,65)
3,50 - 3,60 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	10,9	20,2 - 20,6	0,5(0,9)			
300	+ 0,1	2,8 - 3,6	0,8(1,2)			
1050	5,9-6,1	c, Sp. 4-5	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1050 1350	15,2-17,8 0 - 1				ca. 11	100 300	min. 7,5 5,9- 6,1	300 700 1050	1,4-1,5 5,4-5,6 8,0
ca. 64	9,9 4,0	1090-1100 1185-1215					320-420 = 2,0			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b 4a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1050	3,7 bar 202,0-206,0 (199,0-209,0)	1090-1100*	LDA 1050	9 bar 162,0-166,0 (159,0-169,0)	100	19,5-21 mm ^{FW} Mannet 24 "		
					300	28,0-36,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

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H9

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

FIA 13,8 1

-2-

Pump/governor	Setting	Measurement	Control rod travel diminution difference mm (1)
3804 + 475	0,7 bar	0,36 0,30 0	10,9 - 11,0 10,6 - 10,7 9,7 - 9,9 9,3 - 9,4

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications

Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 13,8 L 2

1. Edition

En

PE 8 P 120 A 920/5 LS 3804

RQV 300-1050 PA 565

supersedes

company: Fiat

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

engine: 8285.22.002

243 kW (330 PS)

Komb.-Nr. 0 401 848 710

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	10,9+0,1	20,2-20,6	0,5(0,9)			
300	5,9-6,1	2,8-3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1050	15,2-17,8	-	-	-	ca. 11	100 300	min. 7,5 5,9-6,1	250 520 780 1050	0,4-0,7 4,1-4,8 5,8-6,0 8,0
ca. 64	9,9 4,0 1350	1090-1100 1185-1215 0 - 1,0				320-420 3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed ②b limitation intermediate speed	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery Idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA	0,7 bar	1090-1100 *	LDA	0 bar	-	-	-	-
1050	2020-206,0 (199,0-209,0)		1050	162,0-166,0 (159,0-169,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

Testoil-ISO 4113

BOSCH

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H11

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

FIA 13,8 L 2 -2-

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 8 P ..LS 3804 + RQV..PA 565	0,36	0,70 0 0,30	10,6-10,7 10,9-11,0 9,3-9,4 9,7-9,9

Notes.

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 VOL 7,0 k

2. Edition

En

Testoil-ISO 4113

PE 6 P 110 A 320 RS 423

RQV 250-1200 PA 435

Komb.-Nr. 0 401 846 448

superseded 5.82

company Volvo

TD 70 G

engine: 157 kW (213 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

3,0 - 3,1

(2,95-3,15)

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,8+0,1	10,2 - 10,4	0,4 (0,8)			2,5 ± 0,1
250	4,5-4,7	0,9 - 1,3	0,3 (0,6)			(2,2 - 2,9)

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 10	100	min. 6,0	200	1,1-1,4
ca. 65	9,8 4,0 1400	1240-1250 1320-1350 0 - 1,0					250	4,5-4,7	530	3,5-3,7
							380-440 = 2,0		870	5,2-5,3
									1200	7,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min	cm³/1000 strokes	rev/min ④a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA	0,7 bar	1240 - 1250*	LDA	0 bar	100	150,0-190,0	-	-
700	102,0-104,0 (99,0-107,0)		700	78,0 - 81,0 (75,0 - 84,0)		bei 20,0-21,0 mm RW		

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

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H13

D. Adjustment Test for Manifold Pressure Compensator

VOL 7,0 k - 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel: diminution difference mm (1)
PE 6 P..RS 423 + ..PA 435	0,7	0 0,35 0,26	10,8 - 10,9 9,5 - 9,6 10,4 - 10,5 9,8 - 10,0

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 UNI 9,6 a
4. Edition

En

PES6P110A720RS3105 RQV275-1150PA642

supersedes 82
company: IVECO-UNIC
8220-22
engine: 176 kW (239 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,2-3,3}
(3,15-3,35) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,7+0,1	12,2-12,4	0,4(0,8)			
275	5,3-5,5	0,9- 1,5	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1190	15,2-17,8	-	-	-	ca. 11	100	min. 6,9	225	0,4-0,7
ca. 60	10,7 4,0 1400	1190-1200 1280-1310 0-1,0				280-375	275	5,3-5,5	535 840 1150	3,5-3,8 5,2-5,5 8,0

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1150	0,7 bar 122,0-124,0 (119,0-127,0)	1190-1200 *	LDA 400	0 bar 87,0-89,0 (84,0-92,0)	100	160,0-180,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

Testoil-ISO 4113

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H15

HAS

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

UNI 9,6 a -2-

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PES6P..RS3105 + .. PA 642	0,23	0,70 0 0,21	11,3-11,4 11,7-11,8 10,5-10,6 10,8-11,0

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 STE 12,0 b 1

1. Edition

En

PE 8 P 110 A 121 LS 3113 RQV 250-1100 PA 652

Komb.-Nr. 0 401 858 701

1 - 5 - 4 - 8 - 6 - 3 - 7 - 2 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

supersedes

company Steyr

WD 815.64

engine: 240 kW

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestrike $\frac{2,8 - 2,9}{(2,75-2,95)}$ mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1101	12,0+0,1	15,8-16,0	0,4(0,75)			
250	1-6,3	1,5-2,1	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1140	15,2-17,8	-	-	-	ca. 12	100	min. 7,7	200	0,7-0,9
ca. 47	11,0	1140-1150					250	6,1-6,3	500	3,7-4,1
	4,0	1185-1215							800	5,4-5,7
	1300	0-1,0					325-385 = 2,0		1100	7,9

Torque control travel a = 0,4 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA	0,9 bar	1140-1150*	LDA	0,9 bar	100	240,0-280,0	100	12,0+0,1
1100	158,0-160,0 (155,0-163,0)		500	159,0-163,0 (157,0-165,0)			310	12,0+0,3
							640	12,2+0,2
			LDA	0 bar			500	12,4+0,1
			500	111,0-113,0 (108,0-116,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

Testoil-ISO 4113

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H17

H17

D. Adjustment Test for Manifold Pressure Compensator

STE 12,0 b 1

-2-

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 8 P..LS 3113 + RQV..PA 652	0,90		12,4 - 12,5
		0	9,7 - 9,8
		0,60	11,8 - 12,0
		0,48	10,8 - 11,0

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 SCA 8,0 i

3. Edition

En

PE 6 P 110 A 720 RS 3034

RQV 20C-1200 PA 554

supersedes 8.81

company Scania

engine: DS 805

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,3-3,4$ mm (from BDC) = RW 9,0-12,0 mm
 (3,25-3,45)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,3+0,1	12,1-12,3	0,6(0,8)			2,5 ⁺ 0,1
225	5,3-5,5	1,5-1,9	0,2(0,4)			(2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1200	15,2-17,8	-	-	-	ca.10	100	min.6,8	150	0,5-0,8
ca. 61	11,3	1240-1250					225	5,3-5,5	500	3,8-4,5
	4,0	1380-1410					320-380=2,0		850	5,9-6,1
	1500	0-1,0							1200	8,4

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed (2b) limitation intermediate speed		Fuel delivery characteristics (5a) high idle speed (5b)		Starting fuel delivery idle switching point		Torque-control (5) travel	
rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
LDA 700	0,7 bar 121,0-123,0 (119,0-125,0)	1240-1250*	LDA 1200	0,7 bar 120,5-123,5 (118,0-126,0)	100	190,0-240,0 =20,0-21,0 mm RW	-	-	
			LDA 500	0 bar 87,0-91,0 (85,0-93,0)					

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.33

Testoil-ISO 4113

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H19

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

SCA 8,0 i -2-

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P..RS 3034 +RQV.. PA 554	0,70	0 0,33 0,22	12,3-12,4 11,1-11,2 12,0-12,1 11,2-11,4

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SCA 11,0 r6
1. Edition

En

PE 6 P 110 A 720 RS 3040 RNV 200-1000 PA 555-1

supersedes -
company: Scania
engine: DS 11

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,3-3,4}
(3,25-3,45) mm (from BDC) = RW 9,0-12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,6+0,1	16,7-16,9	0,4 (0,8)			2,5 ±0,1
225	4,4-4,6	1,6-2,0	0,3(0,5)			(2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1050	15,2-17,8	-	-	-	ca. 10	100	min. 5,9	150	0,5-0,8
ca. 60	12,6 4,0 1300	1040-1050 1140-1170 0 -1,0				250-355	225	4,4-4,6	430 720 1000	3,1-3,6 5,1-5,4 7,9

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 700	0,7 bar 167,0-169,0 (164,0-172,0)	1040-1050*	LDA 1000	0,7 bar 159,0-175,0 (167,0-177,0)	100	220,0-270,0 =RW 20,0- 21,0 mm	-	-
			LDA 500	0 bar 130,0-134,0 (127,0-137,0)				

Checking values in brackets

* 1 mm less control rod travel than col 2

1.83

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H21

H21

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

SCA 11,0 r 6

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 6 P.. RS 3040 + ROV.. PA 555-1	0,41	0,70 0 0,26	13,2-13,3 13,6-13,7 12,0-12,1 12,3-12,5

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

8

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 17,4a

2. Edition

En

Testoil-ISO 4113

PE 10 P 110 A 520/4 LS 846 RQV 250-1150 PA 562

supersedes

company MAN

engine: D 2540 MT

323 kW (439 PS)

 1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 - 9 - 4
 0 - 27 - 72 - 99 - 144 - 171 - 216 - 243 - 288 - 315 $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,0 - 3,1$ mm (from BDC) Zyl. 10
 (2,95-3,15)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1150	11,9+0,1	14,0 - 14,2	0,4(0,8)			
250	6,9-7,1	1,1- 1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1150	15,2-17,8	-	-	-	ca. 12	100 250	min. 8,6 6,9-7,1	200 500	0,6-0,8 4,3-5,3
ca. 64	10,9 5,0 1450	1190-1200 1335-1365 0 - 1,0					400-460 = 2,0		850 1150	6,6-6,7 8,4

Torque control travel \pm mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed	Fuel delivery characteristics		Starting fuel delivery		Torque-control	
rev/min	cm ³ /1000 strokes	limitation intermediate speed	high idle speed	cm ³ /1000 strokes	idle switching point	cm ³ /1000 strokes	travel	Control rod travel
1	2	3	4	5	6	7	8	9
LDA 1150	0,9 bar 140,0-142,0 (137,0-145,0)	1190 - 1200*	LDA 750	0,9 bar 134,0-138,0 (131,0-141,0)	100	145,0-175,0	-	-
			LDA 500	0 bar 115,0-118,0 (112,0-121,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

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H23

H23

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing
XXXXXXX

MAN 17,4 a -2-

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
..LS 846 + ..PA 562	0,9	0,38 0,33 0	11,9 - 12,0 11,7 - 11,8 11,3 - 11,5 11,1 - 11,2

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications

Fuel Injection Pumps ②

and Governors

WPP 00 1/4 MB 21,9a

3. Edition

3.

En

Testoil-ISO 4113

PE 12 P 120 A 320 LS 3819

RQ 750 PA 635

supersedes 6.82

company: Daimler-Benz

 1- 5- 9- 8- 3- 4- 11- 10- 2- 6- 7- 12
 0-15-60-75-120-135-180-195-240-255-300-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

 engine: OM 424 A
 330 kW (449 PS)
 Generator

Komb.-Nr. 0 401 840 705

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

 $4,0-4,1$
 $(3,95-4,15)$

mm (from BDZyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,9 \pm 0,1	19,3 - 19,5	0,5(0,8)			
300	4,8-5,0	1,4 - 2,0	0,8(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
-	-	-	-	10,9 4,0	750-755 780-790	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

750-755 min

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
②		③a		③b		⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	Control rod travel mm 4	rev/min 5	cm ³ /1000 strokes 6	rev/min 7	cm ³ /1000 strokes/mm 8
700	193,0 - 195,0 (190,0 - 198,0)			-	-	100	180,0 - 200,0

Checking values in brackets

Values apply to

engine nozzle-and-holder assemblies 1 683 901 019

and engine fuel-injection tubing 1 680 750 067

3.83

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②

Test Specifications

Fuel Injection Pumps ②

and Governors

40

WPP 001/4 MB 21,9 a 1

1. Edition

En

PE 12 P 120 A 320 LS 3819 RQ 900 PA 634

supersedes-

company: Daimler-Benz

1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 - 12

OM 424 A

0 - 15 - 60 - 75 - 120 - 135 - 180 - 195 - 240 - 255 - 300 - 315° ± 0,5° (± 0,75°)

374 kW

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

and engine fuel-injection tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Komb.-Nr.

0 401 840 704

Testoil-ISO 4113

A. Fuel Injection Pump Settings

 Port closing at prestroke $4,0 - 4,1$ mm (from BDC) Zyl. 12
 $(3,95 - 4,15)$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	12,0+0,1	17,9-18,1	0,5 (0,9)			
300	4,8-5,0	1,2-2,0	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Test specifications Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications Control rod travel mm 9	Test specifications rev/min 10	rev/min 11	Control rod travel mm 12
-	-	-	-	10,8 4,0 1050	900-905 935-945 max. 1,0	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At 900 - 905 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 3a	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes / mm 7
850	179,0-181,0 (176,0-184,0)	-	-	-	-	100	180,0-200,0

Checking values in brackets

3.83

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J2

J2

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MAN 17,4-b 3

1. Edition

En

PE 10 P 120 A 520/5 LS 850 RQ 750 PA 404-2

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4

0-27-72-99-144-171-216-243-288-315° $\pm 0,50$ ($\pm 0,75^\circ$)

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

and engine fuel-injection tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

supersedes

company MAN

engine D 2540 MLE
283 kW

Komb.-Nr.

0 401 849 164

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $3,0-3,1$
(2,95-3,15) mm (from BDC) Zyl. 10

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (for gear-control valves) mm
1	2	3	4	2	3	6
700	11,8+0,1	19,1-19,4	0,5(0,9)			
250	6,6-6,9	2,2-2,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider P-H-G check		Full-load speed regulation				Idle speed regulation				Torque-control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
-	-	-	-	10,8 4,0 900	750-755 780-790 0-1,0	-	-	-	-	-	-

Torque-control travel
on flywheel assembly dimension a =

mm

Speed regulation: M

750-755 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery idle speed	
②		③a	③b		⑥	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes/mm
1	2	3	4	5	6	7
700	191,0-194,0 (188,0-197,0)	-	-	-	100	19,5-21,0 mm RW

Checking values in brackets

2.83

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MAN 11,4 c

1. Edition

En

PES 6 P 120 A 720 LS 457

RQ 750 PA 566

supersedes

company MAN

engine D 2566 MLE

198 kW

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

and engine fuel-injection tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

3,0-3,1
(2,95-3,15)

mm (from BDC) Zyl. 6 = RW 9,0-12,0 mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
700	12,5+0,1	20,2-20,4	0,5(0,8)			
250	6,1-6,3	1,5-2,1	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
-	-	-	-	11,5 4,0 900	750-755 775-785 0-1,0	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

750-755 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3		4	5	6	7
700	202,0-204,0 (199,0-207,0)	-		-	-	100	19,5-21,0 mm RW

Checking values in brackets

Testoil-ISO 4113

①

Test Specifications

Fuel Injection Pumps ① and Governors

WPP 001/4 BET 8,8 a

2. Edition

En

PE 6 P 120 A 320 RS 383 RQV 250-1200 PA 425 R

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

and engine fuel-injection tubing 1 680 750 067

supersedes 2.82

company: RVI

MIDS 062030

engine: 165,5 kW (225 PS)

Komb.-Nr.

0 401 846 404

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

 Port closing at prestroke $2,8 - 2,9$
 (2,75-2,95) mm (from BDC) = RW 9,0 - 12,0 mm

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1200	13,9±0,1	14,8 - 15,1	0,5(0,9)			
275	4,7-4,9	0,8 - 1,4	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1240	15,2-17,8	-	-	-	ca. 12	100	min. 6,3	200	0,2-0,6
ca. 66	12,9	1245-1255					275	4,7-4,9	530	2,9-3,1
	4,0	1340-1370							870	4,8-5,0
	1500	0 - 1,0							1200	8,0

Torque control travel = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	rev/min
1	2	3	4	6	8
LDA 1200	0,7 bar 148,0-151,0 (145,0-154,0)	1245-1255*	LDA 700	100	-
			0,7 bar 144,0-148,0 (141,0-151,0)	120,0-140,0 = RW 19,5 - 21,0 mm	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

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D. Adjustment Test for Manifold Pressure Compensator

BET 8,8 a - 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P..RS 383 + RQV..PA 425 R	0,23	0,70 0 0,19	13,4 - 13,5 13,9 - 14,0 12,2 - 12,3 12,6 - 12,8

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 RVI 8,8 d 1

1. Edition

En

PES 6 P 120 A 320 RS 419 RQV 275-1100 PA 495

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

supersedes:

company: RVI

MIDR 062045

engine:

206 kW (280 PS)

Komb.-Nr.

0 402 046 249

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 - 2,9$
(2,75-2,9) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1100	10,3+0,1	17,7 - 18,1	0,4(0,8)			
275	3,4-3,6	0,5 - 1,1	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1150	15,2-17,8	-	-	-	ca. 8	100	min. 5,0	250	1,0-1,2
ca. 64	9,3	1155-1165					275	3,4-3,6	530	4,0-4,6
	4,0	1220-1250							820	5,9-6,1
	1350	0 - 1,0				280-395			1100	8,1

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed (2b) intermediate speed	Fuel delivery characteristics (5a) high idle speed (5b)		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1100	0,7 bar 177,0-181,0 (174,0-184,0)	1155-1165*	LDA 700	0,7 bar 163,0-196,0 (160,0-172,0)	100	130,0-150,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

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D. Adjustment Test for Manifold Pressure Compensator

- 2 -

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure
increasing

RV1 8,8 d 1

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PES 6 P..RS 419 + RQV..PA 495	0,25	0,70	9,7 - 9,8
		0	10,3 - 10,4
		0,20	8,3 - 8,5
			8,8 - 9,0

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 14,6 0

2. Edition

En

PE 8 P 120 A 320 LS 3816 RQV 350-1150 PA 590
1 - 8 - 7 - 2 - 6 - 3 - 54 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$
Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

supersedes 0.82

company Daimler Benz

engine: OM 422 A

243 kW (330 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $4,0 - 4,1$
(3,95-4,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,0+0,1	15,8-16,0	0,5(0,9)			
350	4,9-5,1	1,2-1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca. 10	100	min. 6,0	300	0,6-0,9
ca. 63	10,0 4,0 1400	1190-1200 1270-1300 0 - 1,0					350	4,5-4,6	580	3,6-3,8
									870	5,2-5,4
									1150	7,6

Torque control travel s = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1150	0,7 bar 158,0-160,0 (155,0-163,0)	1190-1200*	LDA 600	0,7 bar 166,0-172,0 (163,0-175,0)	100	140,0-160,0	1050	11,0+0,1
							850	11,4+0,1
			LDA 500	0 bar 140,0-142,0 (137,0-145,0)			750	11,5+0,2

Checking values in brackets

* 1 mm less control rod travel than col 2

3.83

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

MB 14,6 0

-2-

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PE 8 P..LS 3816 + ..PA 590	0,47	0,70 0 0,40	11,4-11,5 11,6-11,7 10,5-10,6 10,9-11,0

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 12,0 d 1

3. Edition

En

PE 6 P 120 A 320 RS 3050

ROV 250-1100 PA 611

supersedes 82

company Volvo

engine TD 120 F

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

and engine fuel-injection tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Sensors and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke ^{2,4-2,5}
(2,35-2,55) mm (from BDC) - RW 9,0 - 12,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,1+0,1	24,2-24,5	0,5(0,9)			2,5 ^{+0,1} (2,2-2,9)
250	3,8-4,0	2,2-2,6	0,5(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1180	15,2-17,8	-	-	-	ca. 7	100	min. 5,3	200	0,7-0,9
ca. 65	12,1 4,0 1350	1160-1170 1225-1255 0 - 1,0					250 290-350=2,0	3,8-4,0	500 660- 1040 1100	4,2-4,8 5,4-6,6 7,3

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed ②b limitation intermediate speed rev/min ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min cm ³ /1000 strokes		Starting fuel delivery idle switching point ⑥ rev/min cm ³ /1000 strokes		Torque-control travel ⑤ rev/min Control rod travel mm	
1	2	3	4	5	6	7	8	9
LDA 700	1,2 bar 241,5-244,5 (238,5-247,5)	1160-1170*	LDA 700	0 bar 142,5-146,5 (139,5-149,5)	100	20,0-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2
1.83
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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

VOL 12,0 d 1 -2-

Pump/governor	Setting	Measurement	Control rod travel ^{diminution} difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P ..RS 3050 + RQV.. PA 611	0,67	1,2 0 0,30	12,2-12,3 13,1-13,2 9,2- 9,3 10,5-10,7

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 MAN 17,4 b 1

1. Edition

En

PE 10 P 120 A 520/4 LS 850 RQV 250-1150 PA 647

1- 8- 7- 6 - 3 - 5 - 2 - 10- 9- 4
0-27-72-99 -144-171-216-243-288-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

supersedes

company MAN

engine: D 2540 MLE
405 kW

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{3,0-3,1}{(2,95-3,15)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,2 \pm 0,1	18,5-18,8	0,4(0,9)			
250	6,2-6,4	1,2-1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 12	100 250	min. 7,8 6,2-6,4	200 520 830 1150	0,6-0,8 4,9-5,2 6,1-6,4 7,5
ca. 63	10,2 4,0 1400	1190-1200 1255-1285 0-1,0				3a	410-470=2,0			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed ②b limitation intermediate speed	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1150	1,0 bar 185,0-188,0 (182,0-191,0)	1190-1200*	LDA 500	0 bar 119,0-122,0 (116,0-125,0)	100	205,0-225,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

MAN 17,4 b 1

-2-

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 10 P..LS 850 +RQV.. PA 647	1,0	0 0,65 0,54	11,2-11,3 9,6-9,7 10,8-10,9 10,0-10,3

Notes.

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 BRE 30,8 a

1. Edition

En

PE 8 P 130 A 520/6 LS 450 RQV 300-900 PA 500

1-2-6-3-4-5-7-8 je 45° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

and engine fuel-injection tubing 1 680 750 067

supersedes

companyBreda

engine: ID 36 N 8 V

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Komb.-Nr.

0 401 838 020

Testoil-ISO 4113

A. Fuel Injection Pump Settings

 Port closing at prestroke $\begin{matrix} 3,5-3,6 \\ (3,45-3,65) \end{matrix}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	9,2-9,3	16,5-16,8	0,5(0,9)			
300	6,8-7,0	2,2-2,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	990	15,2-17,8	-	-	-	ca.16	100 300	min.8,4 6,8-7,0	250 470 680 900	1,0-1,3 3,8-4,4 5,6-5,8 7,6
ca. 57	8,2 4,0 1150	940-950 1000-1030 0-1,0				300-395 ③a				

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
900	165,0-168,0 (162,0-171,0)	940-950*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets -

* 1 mm less control rod travel than col. 2

2.33

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①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 BRE 9,6 o

1. Edition

En

PE 6 P 120 A 320 RS 461 RQV 300-1500 PA 500

supersedes
Breda
company: ID 32
engine: 243 kW

Values apply to
engine nozzle-and-holder assemblies 1 688 901 019
and engine fuel-injection tubing 1 680 750 067

Komb.-Nr.
0 401 846 478

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,5-3,6}
(3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1500	10,0+0,1	14,5-14,9	0,5(0,9)			
300	7,1-7,3	1,5-2,1	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1500	15,2-17,8	-	-	-	ca. 14	100 300	min. 8,7 7,1-7,3	250 670 1080 1500	1,0-1,2 3,8-4,0 5,9-6,1 8,8
ca. 62	9,0 4,0 1750	1540-1550 1625-1655 0 - 1,0				335-450 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1500	145,0-149,0 (142,0-152,0)	1540-1550*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets:

* 1 mm less control rod travel than col. 2

2.83

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 BFE 9,7 a

1. Edition

En

PE 6 P 120 A 320 RS 460 RQV 300-1500 PA 500

1- 2- 3 - 4 - 5 - 6
0-45-120-165-240-285 ° \pm 0,5 ° (\pm 0,75 °)

supersedes

Breda

company ID 38

engine: 367,5 kW

Komb.-Nr.

0 401 846 477

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,5-3,6}
(3,45-3,65) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1500	10,0+0,1	14,6-14,9	0,5(0,9)			
300	7,8-8,0	1,4-2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1500	15,2-17,8	-	-	-	ca.18	100 300	min.9,4 7,8-8,0	250 670 1080 1500	1,6-1,8 4,0-4,2 6,2-6,4 9,1
ca.63	9,0 4,0 1750	1540-1550 1625-1655 0 - 1,0				335-440 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1500	146,0-149,0 (143,0-152,0)	1540-1550*	-	-	100	19,5-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

2.83

and engine fuel-injection tubing 1 680 750 067

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J17

J17

①

Test Specifications

Fuel Injection Pumps ① and Governors

WPP 001/4 BRE 23,1 a

1. Edition

En

PE 6 P 130 A 320/3 LS 449

RQV 300-900 PA 500

supersedes

company Breda

ID 36 N 6 V

engine: 225 kW

1 - 6 - 5 - 4 - 3 - 2

0 -75 -120-195-240-315° ± 0,5° (± 0,75°)

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

and engine fuel-injection tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Komb.-Nr.

0 401 836 022

Testoil-ISO 4113

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,5 - 3,6$ mm (from BDC)
 $(3,45-3,65)$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	9,2-9,3	16,5-16,8	0,5 (0,9)			
300	6,8-7,0	2,2-2,8	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	990	15,2-17,8	-	-	-	ca. 16	100	min. 8,4	250	1,0-1,3
ca. 57	8,2	940-950					300	6,8 - 7,0	470	3,8-4,4
	4,0	1000-1030							680	5,6-5,8
	1150	0-1,0				300-395			900	7,6

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥	Torque-control travel ⑤		
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
900	165,0-168,0 (162,0-171,0)	940-950*	-	-	100	19,5-21,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

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①

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 MAN 17,4 b 2

1. Edition

En

PE 10 P 120 A 520/4 LS 850 RQV 250-1150 PA 645

1- 8- 7- 6- 3 - 5 - 2 - 10- 9 - 4

0-27-72-99-144-171-216-243-288-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

Values apply to

engine nozzle-and-holder assemblies 1 688 901 019

and engine fuel-injection tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

supersedes

company MAN

engine D 2540 MLE

405 kW (551 PS)

0 401 849 165

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1
(2,95-3,15) mm (from BDC) Zyl. 10

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1150	11,2+0,1	18,6-18,9	0,5(0,8)			
250	6,1-6,3	1,4-2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1200	15,2-17,8	-	-	-	ca. 11	100	min. 7,7	200	0,6-0,8
Ca. 63	10,2	1190-1200					250	6,1-6,3	520	4,8-4,9
	4,0	1255-1285					380-440	= 2,0	830	5,9-6,2
	1400	0 - 1,0							1150	7,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1150	186,0-189,0 (183,0-192,0)	1190-1200 *	-	-	100	270,0-290,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 12,8 n 2

1. Edition

En

PE 8 P 100 A 320 LS 819

RQV 350-1250 PA 378 R

supersedes

company Daimler-Benz

Komb.-Nr. 0 401 848 073

engine OM 402

188 kW (256 PS)

1 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je 45 ° ± 0,5 ° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,4-3,5}
(3,35-3,55) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1230	10,3±0,1	10,0-10,2	0,3(0,6)			
350	7,5-7,7	2,0- 2,4	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1250	15,2-17,8	-	-	-	ca. 18	100 350	min. 9,2 7,5-7,7	300 620 930 1250	0,9-1,1 3,6-3,9 5,3-5,6 8,3
ca. 65	9,3 4,0 1500	1280-1290 1360-1390 0 - 1,0				400-600				

Torque control travel = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1230	100,0-102,0 (98,0-104,0)	1280-1290 *	1230 **	73,0-75,0 (71,0-77,0)	100	110,0-130,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

** Adjusted at the inner lever of the reduced-delivery stop.

2.83

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①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4MB 12,8 n 1

1. Edition

En

PE 8 P 100 A 320 LS 819- 1 RQV 350-1250 PA 378-2

supersedes
company: Daimler-Benzengine: OM 402
188 kW (256 PS)
Komb.-Nr.
0 401 848 0811 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je $45^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke ^{3,4-3,5}
(3,45-3,55) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1230	10,3+0,1	10,0-10,2	0,3(0,6)			
350	7,5-7,7	2,1-2,5	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1250	15,2-17,8	-	-	-	ca. 18	100 350	min. 9,2 7,5-7,7	300 620 930 1250	0,9-1,1 3,6-3,8 5,3-5,6 8,3
ca. 65	9,3 4,0 1500	1280-1290 1360-1390 0 - 1,0				400-600 ③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1230	100,0-102,0 (98,0-104,0)	1280-1290 *	1230	73,0-75,0 (71,0-77,0) **	100	130,0-150,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

** Adjusted at the inner lever of the reduced-delivery stop.

2.83

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SCA 11,0 r

4. Edition

En

PE 6 P 110 A 720 RS 3040, RQV 250-1100 PA 379 R
I...Z

superseded 1.80
company: Scania

PE 6 P 110 A 720 RS 3041, EP/RSV 350-1100 P 1/310 R
I...Z

engine: DS 11
206 kW (280 PS)

Variations in output -sida 3!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{3,30-3,40}{(3,25-3,45)}$ mm (from BDC) RW 10,5

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery 3040 + RQV cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery 3041 + RSV cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	13,0+0,1	15,5 - 15,7	0,4(0,8)	13,0	15,7 - 15,9	3,3 ± 0,1 **
600	13,0+0,1	15,6 - 16,0		13,0	16,1 - 16,5	(max. 0-3,5)
225	4,0-4,2	0,7 - 1,1	0,2(0,4)	350 3,7-3,9	0,7 - 1,1	

Adjust the fuel delivery from each outlet according to the values in

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly

B. Governor Settings

RQV ... 379 R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1100 1400	15,2 - 17,8 0 - 1,0	-	-	-	ca. 10	100 225 310-370 = 2,0	5,5 4,0-4,2 2,0	200 500 800 1100	1,0-1,2 3,8-4,1 5,4-5,6 8,0
ca. 61	12,0 4,0	1140-1150 1250-1280				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1100	0,7 bar 155,0-157,0 (153,0-159,0)	1140-1150*	LDA 600	0,7 bar 156,5-159,5 (154,0-162,0)	100 225	240-290 0-13	-	-
			LCA 500	0 bar 128,0-132,0 (126,0-134,0)	Dispersion max. 2 (4) **			

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

EP/RSV ... 310 R

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1100	16,0	without auxiliary spring			ca. 30	350	6,0		max.
	1150	11,7					100	min. 19		
	1200	6,0								
②a	1140-1150 = 12		with auxiliary spring				350	5,7-6,3		
	1220-1255 = 4,0						400	3,2-4,7		
	1290 0,3 - 1,7						550	0-1		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤ Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1100	155,0 - 157,0 (152,0 - 160,0)	1140-1150*		600	161,0 - 165,0 (158,0 - 168,0)	100	20,5-21,0		
						350	9-13		
							Dispersion max. 2 (4)		
							5,0 -5,5 mm RW**		
							Dispersion max. 4 (7)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure CompensatorTest at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm XXXXXXXXX (1)
PE 6 P .. RS 3040 + RQV .. PA 379 R	0,38		
		0,70	12,8 - 12,9
		0	13,0 - 13,1
		0,28	11,7 - 11,8 12,1 - 12,3

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

En

Increased or reduced outputs of the types listed on page 1-2:

Output variation	Output %	Fuel delivery in cm ³ /1000 strokes at pump speed (min ⁻¹) 1)				Adjustment of control-rod position from 100% setting (mm)
		1100	900	750	600	
P	120	205	208	212	214	+ 2,6
U	115	191	196	198	200	+ 1,9
R	113	186	191	192	195	+ 1,7
W	110	180	185	185	188	+ 1,3
V	108	175	179	179	183	+ 1,0
Y	105	170	173	172	177	+ 0,7
T	103	166	167	166	171	+ 0,4
S	98	154	156	156	158	- 0,2
X	95	146	149	149	150	- 0,5
Q	93	141	145	145	146	- 0,8
Z	90	134	138	139	140	- 1,1
O	88	131	134	136	137	- 1,3
N	85	124	126	130	131	- 1,6
M	80	114	115	119	121	- 2,1
L	75	105	106	108	111	- 2,6
K	70	98	98	98	99	- 3,0
J	65	89	90	90	90	- 3,4
I	60	86	84	83	80	- 3,8

1) Tolerances with fuel quantity are $\pm 1 \text{ cm}^3$ at setting speed.

With subsequent orders from KH/ALP only the standard setting according to page 1-2 will be delivered. If required, the above mentioned variations are to be carried out through your local BOSCH Service Station.

The delivery amounts given in the table have been compiled from Saab-Scania documentation upon their request.

①

Test Specifications

Fuel Injection Pumps ①

and Governors

WPP 001/4 ALO 13,8 a

1. Edition

En

PES 6 P 120 A 320 RS 410 RQV 400-1050 PA 496 K

Komb.-Nr. 0 402 046 201

supersedes -

company: Allis Chalmers

engine: 613.8 I

355 PS

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke ^{2,8-2,9}
 (2.75-2.95) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	11,7+0,1	23,3-23,5	0,4			
400	6,0-6,2	2,5- 3,1	0,4			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 61	1050	15,2-17,8	-	-	-	ca. 17,5	100	min. 7,5	-	-
ca. 59	10,7 4,0 1270	1090-1100 1205-1235 0 - 1,7					400 465-525=2,0 600 max. 1,0			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational speed limitation intermediate speed 3	Fuel delivery characteristics high idle speed 3b		Starting fuel delivery idle switching point 6		Torque-control travel Control rod travel mm 5	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
1050	233,0-235,0	1090-1100*	800	212,0-216,0	100	140,0-180,0	1050 800	11,7 11,2+0,3

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

Testoil-ISO 4113

K1

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BOSCH

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①

Test Specifications Fuel Injection Pumps ① and Governors

WNP 001/4 VOL 7,0 a 2

1. Edition

En

PE 6 P 100/320 RS 169
(A)RQV 200-1200 PA 122/2 R
RQV 250-1200 PA 235/2 Rsupersedes
company: Volvo
engine: TD 70

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,8-2,9}{(2,75-2,95)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0	10,4-11,1	0,5			2,5-0,1 (max. 2,2-2,9)
600	9,0	3,3-4,3				
600	12,0	9,8-11,2				
600	15,0	14,9-16,5				
200	9,0	2,3-3,3				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

.. PA 122/2 R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1290	15,0-18,0	-	-	-	ca. 23	200	8,6-10,0	1290	8,3
	1550	0					300	6,4-8,8		
ca. 66	1200	15,0-17,8					400	2,9-5,4		
	1300	7,7-12,6					500	0,7-2,7		
	1400	0 - 7,6					590	0		
	1500	0				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed ②b idle intermediate speed rev/min ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min cm ³ /1000 strokes	Starting fuel delivery ⑥ idle switching point rev/min cm ³ /1000 strokes	Torque-control travel ⑤ Control rod travel mm			
1	2	3	4	5	6	7	8	9
LDA 700	0,7 bar 82,0-84,0 (81,0-85,0)	1230-1240*	LDA 700	0 bar 63,5-65,5 (62,5-66,5)	100 200 dispersion max. 2,5	150,0-180,0 11,0-15,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

4.83

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K2

K2

B. Governor Settings

.. PA 235/2 R

VOL 7,0 a 2

- 2 -

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	1290 1560	15,0-18,4 0	-	-	-	ca. 13	100 200 300 380 510	8,9-11,0 7,0-10,0 3,8-6,8 0-4,0 0	1290	8,3
ca. 45	1200 1300 1400 1510	15,0-18,2 8,1-13,2 0-7,4 0				(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point	Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8
LDA 700	0,7 bar 82,0-84,0 (81,0-85,0)	1230-1240*	LDA 700	0 bar 59,5-62,5 (58,5-63,5)	100 200	15,0-180,0 11,0-15,0	-
						Dispersion max. 2,5	

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test oil ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm
PE 6 P .. RS 169 + RQV .. PA 122/2R bzw. + RQV.. PA 235/2 R	0,21-0,24	0,07-0,11	

En

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 7,0 i

3. Edition

En

PE6P110A320RS413 Y

RQV 250-1200 PA 499

Komb.-Nr. 0 401 846 439

Succedes 12.82

company: Volvo

TD 70 F

engine: 180 kW (245 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,0-3,1$ mm (from BDC) = RW 9,0 - 12,0 mm
(2,95-3,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,4+0,1	12,9-13,1	0,4(0,8)			2,5 ±0,1
250	4,9-5,1	1,6- 2,0	0,3(0,6)			(max. 2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1200	15,2-17,8	-	-	-	ca. 9	100	min. 6,4	200	0,6-0,8
ca. 62	11,4 4,0 1500	1240-1250 1370-1490 0 - 1,0				300-410	250	4,2-5,1	530 870 1200	3,1-3,5 5,6-5,9 7,9

Torque control travel a - - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test at temp. 40°C (104°F) (2)		Rotational speed (2b) limitation intermediate speed (4a) rev/min	Fuel delivery characteristics (5a) high idle speed (5b) rev/min		Starting fuel delivery (6) idle switching point rev/min		Torque-control (5) travel rev/min	
cm ³ /1000 strokes	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes	cm ³ /1000 strokes	Control rod travel mm		
1	2	3	4	5	6	7	8	9
LDA 700	0,7 bar 129,0-131,0 (126,0-134,0)	1240-1250*	LDA 700	0 bar 78,0-81,0 (75,0-84,0)	100	160,0-200,0 = RW 20,0- 21,0 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

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Testoil-ISO 4113

K4

K4

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

VOL 7,0 i

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
413 Y + 499	0,7	0,51 0,30 0	12,4 - 12,5 12,0 - 12,1 10,7 - 10,9 9,8 - 9,9

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications

Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 n

1. Edition

En

PE 12 A 95 D 610 LS 2453 RQV 750 AB 996 L

1 - 4 - 9 - 8 - 5 - 2 - 11 - 10 - 3 - 6 - 7 - 12

0 - 15 - 60 - 75 - 120 - 135 - 180 - 195 - 240 - 255 - 300 - 315⁰ $\pm 0,5^0$
($\pm 0,75^0$)

supersedes

company: KHD

engine: F 12 L 413 F

Komb.-Nr. 0 400 640 094

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,0 - 2,1}{(1,95 - 2,15)}$ mm (from 3DC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
710	9,5-9,6	8,0 - 8,2	0,3(0,6)			
300	5,6-5,7	0,4 - 0,9	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 27	9,0 4,0	750-755 770-785	-	-	-	-	-	-	-	-

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point	Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8
710	79,5-81,5 (77,5-83,5)	750-755*	-	-	100	120,0-130,0 = 13,8-14,5 mm RW	-

Checking values in brackets

* 1 mm less control rod travel than col. 2
0,5 3.83
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K6

K6

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 m

1. Edition

En

PE 12 A 95 D 610 LS 2453 RQV 300-900 AB 1090 L
Komb.-Nr. 0 400 640 108

supersedes -

company: KHD

engine: F 12 L 413 FW
177 kW (240 PS)
1800 min⁻¹

1- 4- 9- 8- 5 - 2 - 11- 10- 3 - 6 - 7 - 12
0-15-60-75-120-135-180-195-240-255-300-315⁰ ± 0,5⁰ (+ 0,75⁰)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	8,9-9,0	7,2 - 7,4	0,35(0,6)			
300	5,9-6,1	1,4 - 2,0	0,35(0,55)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel ①	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	900	15,2-17,8	-	-	-	ca. 24	100	min. 7,5	250	0,5-0,7
ca. 59	7,9 4,0 1100	940- 950 990-1020 0 - 1,0					300	5,9-6,1	470	4,0-5,2
							340-400 = 2,0		680	6,2-6,5
									900	8,2

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
900	71,5-73,5 (69,5-75,5)	940-950*	750	80,5-83,5 (78,0-86,0)	100	19,0-21,0 mm RW	900	8,9+0,1
			850	72,5-75,5 (70,0-78,0)			400	9,6+0,1
							750	9,2+0,2
							850	9,0+0,2

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

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Testoil-ISO 4113

K7

K7

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 11,0 m

2. Edition

En

Testoil-ISO 4113

PE 6 P 110 A 320 LS 3814

ROV 350-1150 PA 378

supersedes 81

company: Daimler Benz

engine: OM 421

159 kW (216 PS)

Komb.-Nr. 0 401 846 741

 6 - 3 - 5 - 2 - 4 - 1
 0 -45 -120-165-240-285 $\pm 0,5^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke (3,95-4,15) mm (from BDC) RW 9,0-12,0 mm
 4,00-4,10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1130	12,7+0,1	13,5-13,7	0,4(0,8)			
350	8,2-8,4	1,3 - 1,9	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
MAX.	1130	15,2-17,8				ca. 14	100 350	min. 8,5 7,0-7,2	300 670 1500	1,1 3,9-4,1 8,4
ca. 66	12,0 4,0 1400	1170-1180 128 -1310 0 - 1,0				375-485 (3a)				

Torque control travel s = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1130	135,0-137,0 (132,5-139,5)	1170-1180*			100	130,0-150,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

4.83

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①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SCA 8,0 i 1

1. Edition

En

PE 6 P 110 A 720 RS 3034 Z RQV 200-1200 PA 554

Komb.-Nr. 0 40i 846 770

supersedes_

company: Saab Scania

engine: DS8 05

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

 Port closing at prestroke $3,3 - 3,4$
 $(3,25 - 3,45)$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,8+0,1	10,1 - 10,3	0,4(0,8)			$25 \pm 0,1$
225	5,3-5,5	1,5 - 1,9	0,3(0,5)			(2,2 - 2,9)

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1220	15,2-17,8	-	-	-	ca. 16	100	min. 7,4	150	0 - 1,0
ca. 61	10,8 4,0 1500	1240-1250 1360-1390 0 - 1,0					225	5,9-6,1	500	5,4-3,9
							410-470	= 2,0	850	5,4-5,8
									200	7,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control travel	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 700	0,9 bar 101,0-103,0 (99,0-105,0)	1240-1250*	LDA 1200	0,9 bar 111,5-114,5 (109,5-117,0)	100	190,0-240,0 = 20,0-21,0 mm RW	-	-
			LDA 500	0 bar 85,0-89,0 (83,0-91,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.83

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K9

K9

D. Adjustment Test for Manifold Pressure Compensator

SCA 8,0 i 1

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 6 P..RS 3034 Z + RQV..PA 554	0,90	0 0,21	11,8 - 11,9 10,9 - 11,0 11,7 - 11,8

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 VOL 3,6k
1. Edition

En

VE 4/10 F 1900 L 109

0 460 404 029

supersedes Volvo-Penta
company: 8199
engine: 70 PS-B-Leistung

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,2 mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	4,4-4,8 mm		
1.2 Supply pump pressure	1500	6,9-7,5 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	43,0-44,0 cm ³ /1000 strokes		3,0
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	300	20,5-24,5 cm ³ /1000 strokes		3,0
1.5 Start	100	min. 60,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2100	24,5-30,5 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,8-2,6 (1,5-2,9)	1500 (3,9 - 5,3)	1900 5,1-5,9 (4,8-6,2)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 3,7 - 4,3		1900 8,3 - 8,9
Overflow delivery	n = rev/min cm ³ /10 s	600 55 - 138 (40 - 153)		1900 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2350 2300 2100 1900 1500 800 600	max. 4,0 1,0-9,0 (1,0-9,0) (23,5-31,5) 40,0-43,0 (39,2-43,8) (41,2-45,8) 45,0-48,0 (44,2-48,8) 39,5-43,5 (38,5-44,5)	
switch-off	1900	0	
Idle stop	300 400 450	(18,5-26,5) 0,5-6,5 max. 2,5	
End stop	350 450	min. 5,0 max. 48	
2.4 Solenoid	max. cut-in voltage test voltage		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	-
KF	5,7-6,0
MS	1,4-1,6
SVS	max. 4,2
A	
B	

Observations

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Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWV 2,4 8
1. Edition

En

VE 6/10 F 2000 L 115
O 460 406 015

supersedes
company: VWV
engine: 50 Hz. Aggr.

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/...

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1200	2,2 - 2,6 mm		
1.2 Supply pump pressure	1200	4,4 - 5,0 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1200	30,5 - 31,5 cm ³ /1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	350	6,0 - 10,0 cm ³ /1000 strokes		2,5 (3,0)
1.5 Start	100	min. 35,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2070	8,0 - 14,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	900 1,3-2,1 (1,0-2,4)	1200 (1,7-3,1)	1950 4,2-5,0 (3,9-5,3)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,8-3,4		1950 6,4-7,0
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138 (40-153)		1950 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2150	max. 1,5	
	2070	(7,0-15,0)	
	2050	13,0-19,0 (12,0-20,0)	
	1950	22,5-24,9 (21,4-26,0)	
	1200	(28,7-33,3)	
	600	23,0-26,0 (21,5-27,5)	
switch-off elect.	400	0	
Idle stop	430	max. 1,5	
	350	(4,0-12,0)	
End stop	350	min. 30	
	450	max. 30	
2.4 Solenoid	max. cut-in voltage	xxx min. 10 V	
	xxxxxxx	rated voltage 12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,3-6,6
MS	1,4-1,6
SVS	2,7
A	
B	

Observations

3.83

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K12

Test Specifications

Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWV 2,4 g¹

1. Edition

En

VE 6/10 F 1800 L 115-1

0 460 406 016

supersedes ..

company: VWV

engine: 50 Hz. Aggr.

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

- mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1200	2,3- 2,7 mm		
1.2 Supply pump pressure	1200	4,4- 5,0 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1200	30,5-31,5 cm ³ /1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	350	5,0-11,0 cm ³ /1000 strokes		2,5 (3,0)
1.5 Start	100	min. 35,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1830	17,0-23,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	900	1200	1750
	mm	1,1-1,9 (0,8-2,2)	(1,8-3,2)	4,0-4,8 (3,7-5,1)
2.2 Supply pump	n = rev/min	600		1750
	bar (kgf/cm ²)	2,7-3,3		5,8-6,4
Overflow delivery	n = rev/min	600		1750
	cm ³ /10 s	55-138 (40-153)		55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1950	max. 1,5	
	1880	min. 5,0	
	1890	(16,0-24,0)	
	1750	25,3-27,7 (24,2-28,8)	
	1200	(28,7-33,3)	
	600	23,0-26,0 (21,5-27,5)	
switch-off elect.	400	0	
Idle stop	430	max. 1,5	
	350	(4,0-12,0)	
End stop	350	min. 30	
	450	max. 30	
2.4 Solenoid	max. cut-in voltage	xxx min. 10 V	
	max. voltage	rated voltage 12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	6,3-6,6
MS	1,4-1,6
SVS	2,7
A	
B	

Observations

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3.83

K13

Test Specifications Fuel Injection Pumps ② and Governors

En

PE 8 P 120 A 320 LS 3807 RQ 750 PA 374 R
1 - 8 - 7 - 2 - 6 - 3 - 5 - 4 je $45^\circ \pm 0,5^\circ$ ($\pm 0,75^\circ$)

supersedes -

company: Daimler-Benz

engine: OM 422 A

196 kW (266 PS)

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers.

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{4,0 - 4,1}{(3,95 - 4,15)}$ mm (from BDC Zyl. 8)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,5+0,1	17,8 - 18,0	0,5 (0,9)			
300	5,0-5,2	1,2 - 1,8	0,8 (1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Control rod travel mm 2		Setting point rev/min 3		Test specifications Control rod travel mm rev/min 5 6		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm rev/min 9 10		Torque control rev/min 11		Control rod travel mm 12	
-	-	-	-	-	-	10,5 750-755 4,0 785-795		-	-	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a = mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
700	178,0-180,0 (175,0-183,0)	-	-	-	100	200,0-210,0

Checking values in brackets

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 12,0 f 3

1. Edition

En

PE 6 P 120 A 320 RS 3071 Y RQV 250-1025 PA 371

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067.

supersedes

company Volvo

engine: TD 120 G

213 kW (290 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{2,6-2,7}
(2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,2+0,1	17,5-17,8	0,6(0,9)			
250	5,7-5,9	2,2-2,6	0,3(0,6)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca. 12	100	min. 7,2	200	0,7-0,9
ca. 42	9,2	1065-1075					250	5,7-5,9	475	2,7-3,0
	4,0	1145-1175					340-390=2,0		750	4,7-5,0
	1300	0-1,0							1025	6,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed ②b limitation intermediate speed rev/min ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min ④		Starting fuel delivery Idle switching point rev/min ⑥		Torque-control ⑤ Control rod travel rev/min ⑧	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
LDA 700	0,75 bar 175,0-178,0 (172,0-181,0)	1065-1075*	LDA 700	0 bar 155,0-159,0 (152,0-162,0)	100	240,0-280,0 =RW 20,0- 21,0 mm	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.83

Testoil-ISO 4113

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K45

K15

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

-2-
VOL 12,0 f 3

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P..RS 3071 Y +RQV..PA 371	0,29	0,75 0 0,24	9,9-10,0 10,2-10,3 9,2-9,3 9,5-9,7

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 RVI 9,8 b 1

1. Edition

En

PE 6 P 120 A 321 RS 438 RQV 275-1200 PA 648

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067.

supersedes

company: RVI

engine: MID 062045

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $\overset{3,5-3,6}{(3,45-3,65)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	11,2+0,-	13,4-13,7	0,5(0,9)			
275	5,3-5,5	0,7-1,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1230	15,2-17,8	-	-	-	ca. 11	100 275	min. 6,9 5,3-5,5	250 570 880 1200	0-0,9 4,7-5,0 6,1-6,3 8,3
ca. 65	10,2 4,0 1500	1240-1250 1335-1365 0-1,0				270-365 ③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1200	134,0-137,0 (131,0-140,0)	1240-1250*	-	-	100 275	180,0-200,0 7,0-13,0	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 GUS 21,2 a

2. Edition

En

Testoil-ISO 4113

PE 8 P 130 A 520/4 RS 3085 RQV 350-900 PA 602

1 - 2 - 4 - 5 - 6 - 3 - 7 - 8 je $45^0 \pm 0,5^0$ ($\pm 0,75^0$)

superseded 8.81

company: Guascor

engine: E 212

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers.

A. Fuel Injection Pump Settings

Port closing at prestroke		3,2 - 3,3 (3,15-3,35)		mm (from BDC)		
Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm
1	2	3	4	2	3	6
900	8,5-8,6	18,8 - 19,1	0,5(0,9)			
350	4,0-4,2	2,2 - 2,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	950 1100	15,2-17,8 0 - 1	-	-	-	ca. 10	100 350	min. 5,6 4,0-4,2	300 500 700 900	1,0-1,2 2,8-3,2 4,7-5,1 7,8
ca. 58	7,5 4,0	940 - 950 965 - 995				355-455 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed	Fuel delivery characteristics		Starting fuel delivery		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	high idle speed	cm ³ /1000 strokes	idle switching point	cm ³ /1000 strokes	travel	Control rod travel
1	2	3	4	5	6	7	8	9
900	188,0-191,0 (185,0-194,0)	940 - 950*	-	-	100	19,5 - 21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.82

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K18

K19

Test Specifications Fuel Injection Pumps ② and Governors

PE 8 P 120 A 320 LS 3807

RQ 300/1150 PA 511

supersedes 3.82

company: Damiler-Benz

engine: OM 422 LA
276 kW(375 PS)1-8-7-2-6-3-5-4 je 45° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers.

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $4,0-4,1$ mm (from BDC) Zyl. 8
(3,95-4,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
900	11,6+0,1	18,9-19,1	0,5(0,9)			
300	4,8-5,0	1,2-2,0	0,8(1,2)			
1150/600	11,6+0,1	C, Sp.2 u. 5	0,75(1,2)			
500	10,1+0,1	C, Sp. 5	0,75			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5 rev/min 6		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 9 rev/min 10		Torque control rev/min 11 Control rod travel mm 12	
600	19,1-20,8	600	20,0	10,7	1190-1205	300	4,3	100	min.6,0	-	-
VH = max. 46°				4,0	1250-1280			300	4,2-4,4		
				1350	0 - 1,0			335	375=2,0		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At 1190-1205 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
	cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes/mm 7
LDA 900	0,7 bar 189,0-191,0 (186,0-194,0)	-		LDA 600	0,7 bar 182,0-186,0 (179,0-189,0)	100	140,0-160,0
LDA 1150	0,7 bar 185,0-189,0 (182,0-192,0)			LDA 500	0 bar 139,0-141,0 (136,0-144,0)		

Checking values in brackets

2.83

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

MB 14,6 i

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE 8 P .. LS 3807 + RQ .. PA 511	0,44	0,70 0 0,34	11,1-11,3 11,6-11,7 10,1-10,2 10,5-10,7

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MB 21,9 d

1. Edition

En

PE 12 P 120 A 320 LS 3819-2 RQ 300/1050 PA 656

supersedes-

1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 - 12

company: Daimler-Benz

0 - 15 - 60 - 75 - 120 - 135 - 180 - 195 - 240 - 255 - 300 - 315 $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

OM 424 LA

441 kW

Values only apply to test nozzle-and-holder

Komb.-Nr. 0 401 840 713

assembly 1 688 901 019 and fuel-injection test

tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke

(3,95-4,15)

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	11,8+0,1	19,2-19,4	0,5(0,9)			
300	5,0-5,2	1,4-2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2		Test specifications Control rod travel mm 4				Test specifications Control rod travel mm 8				Control rod travel mm 12	
600	19,1-20,8	600	20,0	10,8	1095-1110	300	4,6	100	min.6,0	-	-
				4,0	1165-1195			300	4,5-4,7		
				1300	0-1,0			340-380	= 2,0		

Torque-control travel

on flyweight assembly dimension a =

mm

Speed regulation: At

1095-1110 min⁻¹

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery idle speed rev/min 6	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes/mm 7	
LDA	0,6 bar	-		LDA	0 bar	100	170,0-190,0
1050	192,0-194,0 (189,0-197,0)			500	141,0-143,0 (138,0-146,0)		(166,0-194,0)

Checking values in brackets

D. Adjustment Test for Manifold Pressure Compensator

MB 21,9 d

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE12P...LS3819-2 + RQ...PA656	0,60	0 0,43 0,38	11,8 - 11,9 10,8 - 10,9 11,4 - 11,5 11,1 - 11,3

Notes.

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 FIA 13,8 a 2

2. Edition

En

Testoil-ISO 4113

PE 6 P 120 A 720 RS 167

R0225/1100 PA 336 R

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067.

supercedes 10.80

company: Fiat

8210.12.275

engine: 154,5 kW (210 PS)

Komb.-Nr. 0 401 846 429

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15) mm (from BDC)
2,00-2,10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,3±0,1	16,3 - 16,6	0,5(0,9)			
225	7,5-7,7	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2		Test specifications Control rod travel mm 4				Test specifications Control rod travel mm 10				Control rod travel mm 12	
550	15,6-16,4	550	16,0	9,3	1145-1160	225	5,3	100	min.6,8	1100	10,3-10,5
								225	5,2-5,4	550	10,3-10,5
1300	0 - 1			4,0	1190-1220			315	355 =2,0		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery idle speed rev/min 6	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes/mm 7	
1100	163,0 - 166,0 (160,0 - 169,0)					100	19,5-21,0 mm R ₁
						225	5,3

Checking values in brackets

3.83

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K23

K23

Test Specifications

Fuel Injection Pumps ②

and Governors

FIA 13,8 a 4
2. Edition

En

Testoil-ISO 4113

PE 6 P 120 A 720 RS 167 Z RQV 225/1100 PA 118 R
Komb.-Nr. 0 401 846 225

superseded 81
company: Fiat
engine: 221 A
210 kW (286 PS)

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,0 - 2,1$ mm (from BDC)
 $(1,95 - 2,15)$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	21,1 ± 0,1	17,0 - 17,3	0,5(0,9)			
225	7,5-7,7	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	15,6-16,4	600	16,0	10,1	1145-1160	225	7,6	100	min. 9,1	1100	11,1-11,2
								225	7,5-7,7	550	11,1-11,3
1350	0 - 1,0			4,0	1190-1220				365-405 = 2,0		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At $1145-1160 \text{ min.}^{-1}$

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
②		③a		③b		⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
1100	170,0-173,0 (167,0-176,0)	-		-	-	100	19,0-21,0 mm R _W

Checking values in brackets

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 UNI 13,8 a
2. Edition

En

Testoil-ISO 4113

PE 6 P 120 A 720 RS 167y RQ 225/1100 PA 118 R
Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067.

supersedes 3.82
company: UNIC/IVECO
engine: 8210.02.051
Komb.-Nr. 0 401 846 366

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,0 - 2,1$
(1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,5+0,1	16,6 - 16,9	0,5(0,9)			
225	7,5-7,7	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 4		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 8		Torque control rev/min 11		Control rod travel mm 12	
550	15,6-16,4	550	16,0	9,5 4,0 1300	1145-1160 1190-1220 0 - 1,0	225	6,0	100 225 340-380	min. 7,5 5,9-6,1 =2,0 mm	1100 550	10,5-10,6 10,5-10,7		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1145-1160 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery idle speed rev/min 6		Control rod travel mm 7	
1100	166,0 - 169,0 (163,0 - 172,0)	-	-	-	-	100	19,0-21,0 mm RW		

Checking values in brackets

3.83

②

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 JEM 16,5 a

1. Edition

En

PE 8 P 130 A 920/4 RS 301 RQ 750 PA 426 R

1-6-2-4-8-3-7-5 je $45^\circ \pm 0,5^\circ$ ($\pm 0,75^\circ$)

supersedes

company: Jenbacher Werke

engine: C 160 S

Komb.-Nr. 0 401 848 076

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,5-2,6
(2,45-2,65)

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,0+0,1	24,4-24,8	0,5(0,8)			
300	6,1-6,3	2,1-3,0	0,8(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Test specifications Control rod travel mm 5	rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
-	-	-	-	11,0 4,0 900	750-755 775-785 0 - 1,0	-	-	-	-	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: AI

750-755 min 1

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery idle speed	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
700	244,0-248,0 (241,0-251,0)	-	-	-	100	19,5-21,0 mm RW

Checking values in brackets

3.83

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②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 FIA 13,8a
8.Edition

En

Testoil-ISO 4113

PE 6 P120/720 RS 167 RQ 225/1100 PA 118 R

superseded 2.81
company: Fiat
engine: 8210.02

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke
2,00-2,10
(1,95-2,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,1+0,1	19,3 - 19,7	0,5(0,8)			
225	7,5-7,7	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2		Control rod travel mm 4		Test specifications rev/min 6		Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 12	
600		15,6-16,4		600		16,0		10,1 4,0		1145-1160 1190-1220	
225		7,6		100		min.9,1 7,5-7,7 365-405= 2,0		1100		11,1-11,2 11,1-11,3	
1350		0 - 1									

Torque-control travel
on flyweight assembly dimension s = mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev./min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
cm ³ /-1000 strokes 2				cm ³ /-1000 strokes 5		cm ³ /1000 strokes/mm 7	
1100		193,0-197,0 (190,0-200,0)				100	
						19,5-21,0 mmRW	

Checking values in brackets

3.83

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Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MB 11,4 h 1

1. Edition

En

PES 6 P 110 A 820 LS 422 RQ 300/950 PA 483-1

Komb.-Nr. 0 402 046 243

supersedes

company: Daimler-Benz

engine: OM 407

137 kW (186 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(2,95-3,15)

mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
950	11,0+0,1	10,1 - 10,3	0,4 (0,8)			
300	7,8-8,0	1,1 - 1,7	0,4 (0,7)			

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min	Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
600	13,0-13,8	600	13,4	10,0 4,0 1150	995-1010 1015-1045 0 - 1,5	300	7,9	100 300 375-415	min.9,5 7,8-8,0 = 2,0	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery idle speed	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes/mm
1	2	3	4	5	6	7
950	101,0-103,0 (98,0-106,0)	-	600	92,0-96,0 (89,0-99,0)	100	130,0-150,0

Checking values in brackets

9.82

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 PEN 10,0 d 2

1. Edition

En

PE 6 P 110 A 320 RS 138 Z

RSV 200-1000 P 1/305 R

Komb.-Nr. 0 401 876 262

supersedes -

company Volvo-Penta

engine D 100 B/PP

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,6 - 2,7$
(2,55-2,75) mm (from BDE) RW 9,0 - 12,0 mm

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	8,4-8,5	8,8-9,0	0,4 (0,8)			
225	5,3-5,5	1,0-1,4	0,3 (0,6)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed 4			4 Lower rated speed Control-lever deflection in degrees 7			3 Torque control Control rod travel rev/min mm 10 11	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	rev/min 8	Control rod travel mm 9			
loose	800	0,3-1,0	-	-	-	ca. 23	225	4,9	-	-
	X =						100	min. 20,0		
							225	5,3-5,5		
ca. 54	7,4	1040-1050					310-370	= 2,0		
2a	4,0	1070-1100								
	1230	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		6 Rotational-speed limit Note: changed to ... rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop Control rod travel mm 9	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7			
700	88,0-90,0 (85,0-93,0)	1040-1050*	-	-		100	310,0-340,0 = 20,0-21,0 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

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L5

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 EIC 3,9 g

1. Edition

En

PES 6 A 80 D 320 RS 2652 RSV 300-1050 A 0 B 2001-1 R

Komb.-Nr. 0 400 876 314

supersedes: -

company: Eicher

engine EDL6-1

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15-2,25
(2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	10,4+0,1	6,5-6,6	0,2(0,35)			
300	6,9-7,1	1,1-1,7	0,2(0,3)			
600	-	C, Sp. 4 u. 5	0,3			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed			4 Lower rated speed Control lever deflection in degrees 7			3 Torque control Control rod travel mm 11	
Control rod travel mm 2	Control rod travel mm rev/min 3		4	5	6	rev/min 8	Control rod travel mm 9		rev/min 10	
loose	800 0,3-1,0 X = 5,0		-	-	-	ca. 25	300 6,5		1050 10,4-10,5	
ca. 47	9,4 1090-1100						100 min. 19,0		500 11,4-11,5	
2a	4,0 1165-1195						300 6,9-7,1		820 10,9-11,1	
	1310 0,3-1,7						515-575 = 2,0			
							650 max. 1,0			

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		6 Rotational-speed limit Note: changed to .) rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop Control rod travel mm 9	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		cm ³ /1000 strokes 7			
1050	64,5-65,5 (63,0-67,0)	1090-1100	600	68,5-70,5 (67,0-72,0)		100	100,0-110,0 = 16,2-16,8 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

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Testoil-ISO 4113

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VW 2,4 g2

1. Edition

En

VE 6/10 F 1500 L 115-2

0 460 406 017

supersedes-

company: VW

engine: 50 Hz. Aggr.

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

-

mm

see VDT-W-460/.

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1200	2,4 - 2,8 mm		
1.2 Supply pump pressure	1200	4,3 - 4,9 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1200	30,5 - 31,5 cm ³ /1000 strokes		2,5 (3,0)
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	350	6,0 - 10,0 cm ³ /1000 strokes		2,5 (3,0)
1.5 Start	100	min. 35,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	1530	15,0 - 21,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	900 0,5-1,3 (0,2-1,6)	1200 (1,9-3,3)	1450 3,5-4,3 (3,2-4,6)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,7-3,3		1450 5,0-5,6
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138 (40-153)		1450 55-138 (40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1600	max. 1,5	
	1555	5,5-14,5 (5,0-15,0)	
	1530	(14,0-22,0)	
	1450	26,8-29,2 (25,7-30,3)	
	1200	(28,7-33,3)	
	600	23,0-26,0 (21,5-27,5)	
switch-off elect.	400	0	
Idle stop	430	max. 1,5	
	350	(4,0-12,0)	
End stop	350	min. 30	
	450	max. 30	
2.4 Solenoid	max. cut-in voltage xxx min. 10 V rated voltage 12V.		

3. Dimensions

for assembly
and adjustment
mm

Designation	mm
K	3,2-3,4
KF	6,3-6,6
MS	1,4-1,6
SVS	2,7
A	
B	

Observations

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3.83

Test Specifications

Distributor-type Fuel-injection Pumps

WPP 001/4 VW 1,6 L 3

1. Edition

En

VE 4/9 F 2400 R 66-14

0 460 494 118

supersedes-
company: VW
engine: 086

Overflow temperature 45° C

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460V.

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,3-2,7 mm		
1.2 Supply pump pressure	1500	4,9-5,5 bar (kgf/cm ²)		
1.3 Full-load delivery without charge-air pressure	1500	31,5-32,5 cm ³ /1000 strokes		3,0
Full-load delivery with charge-air pressure	-	- cm ³ /1000 strokes		
1.4 Idle speed regulation	450	6,0-10,0 cm ³ /1000 strokes		3,0
1.5 Start	100	min. 38,0 cm ³ /1000 strokes		
1.6 Full-load speed regulation	2600	11,0-17,0 cm ³ /1000 strokes		
1.7 Load-dependent start of delivery	-	-		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 0,7-1,5(0,4-1,8)	1500 (1,8-3,2)	2400 5,5-6,3(5,2-6,6)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,8-3,4		2400 7,0-7,6
Overflow delivery	n = rev/min cm ³ /10 s	600 55-138(40-153)		2400 55-138(40-153)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2800	max. 2,5	
	2600	(10,0-18,0)	
	2400	26,5-28,5 (25,2-29,8)	
	1500	(29,7-34,3)	
	600	19,5-22,5 (18,0-24,0)	
switch-off elektr.	400	0	
mech.	2400	0	
Idle stop	1200	max. 6,0	
	600	max. 7,0	
	450	(4,0-12,0)	
End stop	400	min. 15,5	
	500	max. 21,5	
2.4 Solenoid	max. cut-in voltage xxxxxxx	xxx min. 10 V rated voltage 12V.	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-6,0
MS	1,3-1,5
SVS	
A	
B	
Observations	

BOSCH

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Test Specifications Fuel Injection Pumps ② and Governors

PE 6 P 100 A 720 RS 447 RQ 225/1200 PA 617

Komb.-Nr. 0 401 846 471

supersedes -

company: DAF

engine: DHT 825

Testoil-ISO 4113

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at stroke $3,2 - 3,3$ mm (from BDC)
 $(3,15 - 3,35)$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	11,4±0,1	11,8-12,0	0,3(0,6)			
225	5,3-5,5	0,7- 1,1	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRIG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 4		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 9		Torque control rev/min 11	
	Control rod travel mm 2				rev/min 6		Control rod travel mm 8		Control rod travel mm 10		Control rod travel mm 12
650	15,6-16,4	650	16,0	10,4 4,0 1450	1235-1250 1305-1335 0 - 1,0	225	5,4	100 225 365-405 = 2,0	min. 6,0 5,3- 5,5	1000 1200	11,4-11,5 11,3-11,5

 Torque-control travel on flyweight assembly dimension a = 0 mm Speed regulation: At 1235-1250 min⁻¹ 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
	cm ³ /1000 strokes 2				cm ³ /1000 strokes 5		Control rod travel mm 7
LDA 1000	0,7 bar 118,0-120,0 (116,0-122,0)	-	-	LDA 600	0 bar 94,0-97,0 (92,0-99,0)	100	195,0-215,0 = RW 19,5 - 21,0 mm

Checking values in brackets

3.83

D. Adjustment Test for Manifold Pressure Compensator

DAF 8,3 0 1 - 2 -

Test at n = 600 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 6 P..RS 447 + RQ..PA 617	0,32	0,70 0 0,27	11,2 - 11,3 11,4 - 11,5 10,4 - 10,5 10,6 - 10,8

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 19,0 g

2. Edition

En

Testoil-ISO 4113

PE 12 A 95 D 610LS 2449 RQV 300-1250 AB 1105 L

Komb.-Nr. 0 400 640 109

1 - 4 - 9 - 8 - 5 - 2 - 11 - 10 - 3 - 6 - 7 - 12

0- 15- 60-75 -120-135-180-195-240-255-300-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

superseded 9.82

company: KHD

engine: BF 12 L 413 F

353 kW / 2500 min⁻¹

A. Fuel Injection Pump Settings

 Port closing at prestroke (1,75-1,95) mm (from BDC) :
 1,80-1,90

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1250	11,3	11,4 - 11,6	0,2(0,25)			
300	5,9-6,1 + 0,1	0,9 - 1,5	0,7(0,9)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1250	15,2-17,8				ca. 12	100 300	min. 7,5 5,9-6,1	250 580 920 1250	0,3-1,3 2,7-3,2 4,5-5,0 8,3
ca. 66	10,3 4,0 1500	1290-1300 1360-1390 0-1,0				325-410				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9 + 0,1
LDA 1250	0,7 bar 113,5-115,5 (111,5-117,5)	1290-1300*	LDA 900	0,7 bar 118,0-121,0 (116,0-123,0 0 bar 69,0- 71,0 (67,0- 73,0)	100	130,0- 140,0	1250 1100 900	11,3 11,6 11,6

Checking values in brackets

* 1 mm less control rod travel than col. 2

4.83

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L11

L41

D. Adjustment Test for Manifold Pressure Compensator

KHD 19,0 g -2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
2449 + 1105 L	0,7	0,45 0,20 0	11,6 - 11,7 11,5 - 11,6 10,0 - 10,2 9,4 - 9,5

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 13,8 a 3

4. Edition

En

Testoil-ISO 4113

PE 6 P 120 A 720 RS 167 Z RCV 225-1100 PA 177 R

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067.

supersedes 9.82

company: Fiat

engine: 8210.02

154,5 kW (210 PS)

Komb.-Nr. 0 401 846 378

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15) mm (from BDC)
2,00-2,10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,3+0,1	16,3 - 16,6	0,5(0,9)			
225	7,5-7,7	1,7 - 2,3	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1100	15,2-17,8	-	-	-	ca. 13	100 225	min. 9,0 7,5-7,7	225 400 100	0,9-1,0 2,4-2,6 8,4
ca. 62	9,3 4,0 1350	1140-1150 1190-1220 0 - 1,0				285-400 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥	Torque-control travel ⑤		
rev/min	cm ³ /1000 strokes	rev/min ④a	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1100	163,0-166,0 (160,0-169,0)	1140-1150*			100	19,5-21,0 mm RW		

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

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①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 21,9 b

2. Edition

En

PE12P120A320LS3819-1 RQV 350-1150PA493

PA 493-2

1- 5- 9- 8- 3 - 4 - 11 -10- 2 - 6 - 7 - 12

0-15-60-75-120-135-180-195-240-255-300-315° $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

supersedes 10,82

company: Daimler-Benz

engine: OM 424 A

390 kW (530 PS)

Komb.-Nr. 0 401 840 710

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,95-4,15) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1150	11,1+0,1	15,9-16,1	0,5(0,8)			
350	4,8-5,0	1,4 - 2,0	0,8(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1150	15,2-17,8	-	-	-	ca. 14	100	min. 8,5	300	0,9-1,1
ca. 64	10,4	1190-1200 1280-1310					350	6,9-7,1	580 870 1150	3,5-3,7 5,2-5,4 7,8
	1375	0-1,0				400-600				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1150	0,6 bar 159,0-161,0 (156,0-164,0)	1190-1200*	LDA 650	0,6 bar 164,0-170,0 (161,0-173,0)	100	130,0-150,0	-	-
			LDA 500	0 bar 127,0-129,0 (124,0-132,0)				

Checking values in brackets

Values only apply to test nozzle-and-holder
assembly 1 688 901 019 and fuel-injection test
tubing 1 680 750 067.

* 1 mm less control rod travel than col. 2

3.83

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Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
PE12P..LS3819-1 + ..PA 493	0,38	0,60 0 0,32	10,8-10,9 11,1-11,2 9,8-9,9 10,1-10,3

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 MB 5,7 t
2. Edition

En

Testoil-ISO 4113

PES 6 A 90 D 410 RS2293 RQV 300-1425 AB982DL
Komb.-Nr. 0 400 846 394

superseded by 8.77
company Daimler-Benz
engine OM 352 A
126,5 kW (172 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke ^{2,15-2,25}
(2,10-2,30) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1400	11,1+0,1	7,7 - 7,8	0,3(0,45)			
300	7,8-8,0	0,9 - 1,5	0,2(0,4)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1425	16,0-19,3	-	-	-	ca.10	100 300 570 - 800	min.7,5 5,9-6,1 630=2,0 0 - 1	300 1000 1450	0,6-1,4 5,0-5,4 8,3
ca.61	10,1 4,0 1675	1440-1450 1555-1585 0 - 1,0					370 - 440		-	-

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm +0,1 9
LDA 1400	0,3 bar 77,0 - 78,0 (75,0 - 80,0)	1440-1450 *	LDA 500	0,18 bar 70,0 - 73,0 (68,0 - 75,0)	100 300	13,7-14,3 mm RW 9,0-15,0	1400 1200	11,1 11,5
1200	79,0 - 82,0 (77,0 - 84,0)		LDA 1400	0 bar 62,0 - 64,0 (60,0 - 66,0)	100-220 (80-240)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

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D. Adjustment Test for Manifold Pressure Compensator

MB 5,7 t - 2 -

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
PES 6 A..RS 2293 + RQV..AB 982 DL	0,21	0,70 0 0,16	11,0-11,1 11,9-12,0 9,3-9,4 9,6-10,0

Notes

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 KHD 12,7 n
2. Edition

En

PE 8 A 95 D 410 LS 2609 RQV 300-1250 AB 1128 L

Komb.-Nr. 0 400 648 129

1 - 8 - 7 - 2 - 6 - 5 - 4 - 3 je 45 ° $\pm 0,5$ ° ($\pm 0,75$ °)

supersedes 9.82

company KHD

engine: BF 8 L 413 F
235 kW (320 PS)
2500 min⁻¹

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{1,8-1,9}{(1,75-1,95)}$ mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1250	11,6 \pm 0,1	11,6-11,7	0,3(0,6)			
300	5,9-6,1	1,6-2,2	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1250	15,2-17,8	-	-	-	ca. 11	100	min. 7,5	250	0,5-0,8
ca. 57	10,6	1290-1300					300	5,9-6,1	380	2,9-3,1
	4,0	1370-1400							920	4,7-4,9
	1450	0 - 1,0				380-550			1250	7,7

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1250	0,7 bar 116,0-117,0 (114,0-119,0)	1290-1300 *	LDA 750	0,7 bar 121,0-124,0 (119,0-126,0)	100	130,0-140,0 15,2- 15,6 mm RW	1250	11,6 \pm 0,1
			LDA 500	0 bar 101,5-103,5 (99,5-105,5)			750	12,4 \pm 0,1
							1000	12,1 \pm 0,2

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

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L18

L18

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE 8 A .. LS2609 + .. AB 1128	0,27	0,7 0	12,1-12,2 12,4-12,5 11,7-11,8

Notes

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 21,9 e

2. Edition

En

PE 12 P 120 A 320 LS 3821 RQV 350-1150 PA 493-1

1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 - 12
0 - 15 - 60 - 75 - 120 - 135 - 180 - 195 - 240 - 255 - 300 - 315° ± 0,5°

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

supersedes 0.82

company Daimler-Benz

engine: OM 424 LA

441 kW (600 PS)

Schneefräse

Komb.-Nr. 0401 840 712

Testoil-ISO 4113

A. Fuel Injection Pump Settings

Port closing at prestroke $4,0 - 4,1$ mm (from BDC) Zyl. 12
(3,95-4,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,6+0,1	17,5-17,7	0,5(0,8)			
350	5,0-5,2	1,4-2,2	0,8(0,7)			
650	11,6+0,1					
500	10,4+0,1	C, Sp. 4u.5	0,75			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1150	15,2-17,8	-	-	-	ca. 8	100 350	min. 6,7 5,0-5,2	300 580 870 1150	0,9-1,1 3,4-3,8 5,1-5,4 7,8
ca. 58	10,6 4,0 1350	1190-1200 1240-1270 0 - 1,0				400-600 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1150	0,6 bar 175,0-177,0 (172,0-180,0)	1190-1200*	LDA 650	0,6 bar 171,0-179,0 (168,0-182,0)	100	140,0-160,0	-	-
			LDA 500	0 bar 143,0-145,0 (140,0-148,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

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D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
PE12P...LS3821 + ..PA493-1	0,39		11,3 - 11,4
		0,60	11,6 - 11,7
		0	10,4 - 10,5
		0,30	10,6 - 10,8

Notes.

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAC 11,0 x 6

1. Edition

En

US-PES6P110A720RS6006

US-RQV300/600-1050PA621-7K

supersedes-

company Mack

engine: EME 6 - 250
250 PS

Komb.-Nr. 9 400 231 171

PLE-Maß = 0,740" - 0,820"

See Service Information VDT-I-MAC 002!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\begin{matrix} 3, 2-3, 3 \\ (3, 15-3, 35) \end{matrix}$ mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1050	11,7+0,1	17,7 - 17,9	0,4			
300	5,2-5,4	2,4 - 3,0	0,4			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
max.	1120	15,2-17,8	-	-	-	ca. 20	250	9,8-11,3	-	-
ca. 61	10,7	1090-1100					300	7,9-8,1		
	4,0	1165-1195					400	3,8-5,2		
	1230	0 - 1,0					690-750 = 2,0			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1050	176,5-178,5	1090-1100 *	850	184,0-188,0	100	120,0-180,0	1050	11,7	
			630	202,0-206,0			1000	11,6+0,1	
			800	121,0-129,0			850	11,9+0,1	
				PLE			750	12,2+0,1	
							630	12,8+0,1	
							500	12,1+0,1	

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.83

Testoil-ISO 4113

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